REPORT OF THE INDIAN TARIFF BOARD ON THE SALT INDUSTRY

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B.B.R.A.S.

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REPORT

OF THE

Indian Tariff Board

ON THE

SALT INDUSTRY.

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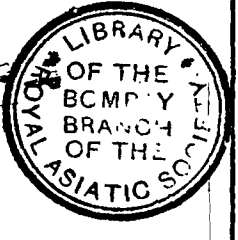

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Members	Mr. A. E. Mathias, I.C.S. (up to 26th March 1930). Dr. John Matthai.
Secretary	Mr. R. L. Walker, I.C.S.

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PRELIMINARY.

Terms of reference.

By a Resolution of the Government of India in the Commerce Department, No. 601-T. (1) of the 25th July, 1929, the Tariff Board was directed to report whether having regard to all relevant considerations it is desirable in the national interest that steps should be taken to encourage the production of salt in India suitable for consumption in those markets which are at present largely supplied from abroad. The actual terms of reference were as follows:—

"The Taxation Enquiry Committee reported in 1926 that it was desirable to make India self-supporting in the matter of salt supply, if this end could be secured by the granting of a purely temporary advantage to the local manufacturer, whether by way of a rebate of duty or of a differential duty on import or both, and recommended that an enquiry should be made into this matter by the Tariff Board. This recommendation was, along with other recommendations of the Committee relating to salt, examined by the Central Board of Revenue with the assistance of Mr. D. N. Strathie, I.C.S., an officer who had had considerable experience of Salt administration in Madras. The main conclusions of the Board were briefly as below:—

(*a*) The problem of making the mainland of India (as distinguished from Burma) self-supporting in the matter of salt supply resolves itself into that of capturing for Indian salt the market for fine white crushed salt in Bengal, since no attempt could reasonably be made to compel the consumer in Bengal to take the ordinary Madras or Bombay salt.

(*b*) The cost of transporting salt to Bengal from those places in India at which salt suitable for that market could be produced, and the extent to which such transport could be made available, were factors of the greatest importance.

(*c*) The probable limitations upon the output of sources in India which could produce the required quality of salt were such that, on the evidence available, a reasonable probability that India could be made self-supporting in this respect could not be regarded as established.

2. The Central Board of Revenue, therefore, reported that there was no *primâ facie* case for reference to the Tariff Board. As regards Burma, however, Mr. Strathie recommended that, in view of the special conditions there, there was a *primâ facie* case for reference to the Tariff Board. The Central Board of Revenue recognised that, if that province had stood by itself, the course suggested by Mr. Strathie could have been adopted, but felt that the adoption of different rates of customs duty for goods imported

into different parts of India would be a violation of important principles governing tariff policy.

3. The Government of India accepted the conclusion of the Central Board of Revenue that there was no *primâ facie* case for reference to the Tariff Board so far as the Salt industry in India (excluding Burma) was concerned. The decision of the Government of India was published in Finance Department (Central Revenues) Resolution No. 20, dated the 12th May 1928. As regards Burma, they considered that means should be explored other than the grant of a differential duty in order to secure protection for the local industry. This subject is under active discussion at present with the Government of Burma.

4. During the last session of the Legislative Assembly the question of making a reference to the Tariff Board regarding the salt industry came under discussion in the Assembly in the course of a motion made by Mr. N. C. Kelkar to reduce the grant under the head "Salt" by Rs. 100. The discussion showed that there was a strong feeling in the Assembly that the question should be referred to the Tariff Board. In the course of the debate, the Hon'ble Sir George Rainy and the Hon'ble Sir George Schuster explained that the decision taken by Government not to refer the case to the Tariff Board was not final and had reference only to the circumstances at the time, and promised that the matter would be re-examined in the light of the events that had happened since the previous decision was taken.

5. Subsequent to the above debate, the Hon'ble Finance Member and the Members of the Central Board of Revenue visited Karachi in order to inspect the progress that has been made with the manufacture of salt since Mr. Strathie reported and to assess the possibilities of increased production there and elsewhere. As a sequel to these visits, the Government of India have reconsidered the position. They are still satisfied as to the essential correctness of the first two of the three conclusions cited in the opening paragraph of this Resolution; but as regards the third of these conclusions, they consider, in the light of recent experience in the production of fine white salt at Karachi and of the emergence of certain other possibilities, that it is necessary to re-examine the situation. They have now decided therefore that a reference to the Tariff Board need no longer be regarded as premature, and that, in view of the public interest which has been displayed in this matter, the Board shall be directed to set up an enquiry forthwith.

6. The Tariff Board will accordingly be asked to report whether, having regard to all relevant considerations, it is desirable in the national interest that steps should be taken to encourage the production of salt in India suitable for consumption in those markets which are at present largely supplied from abroad, and if so, what measures they recommend. The Board should take into account the relations between the Government of India and Aden and the conditions of the existing salt industry in the latter place and should make such special recommendations, if any,

affecting the treatment of salt produced there as may seem to them to be appropriate. They should also note that it is already the settled policy of the Government of India to allow salt produced in the Indian States and transported to Bengal or Burma by sea admission to the markets in those areas, subject to reasonable safeguards to secure that the revenue accrues to the Government of India and that there is no illicit removal *en route*.

7. All persons interested in the enquiry should communicate with the Secretary to the Tariff Board, who will announce in due course the dates on which and the places at which the enquiry will be held."

The Board's communiqué.

2. The principal markets in India at present supplied from abroad are Bengal and Burma. In view of the fact that the President, Sir Padamji P. Ginwala, had arranged to go on leave early in 1930 and that the time at the disposal of the Board did not permit of its studying conditions both in Bengal and Burma it was decided to investigate the problem in relation to India proper in the cold weather of 1929-30 and to leave for consideration at a later date that part of the enquiry which concerns Burma. The Board issued the following Press Communiqué on the 16th August, 1929:—

"In their Resolution No. 601-T. (1), dated 25th July, 1929, the Government of India have asked the Indian Tariff Board to report whether, having regard to all relevant consideration, it is desirable in the national interest that steps should be taken to encourage the production of salt in India suitable for consumption in those markets which are at present largely supplied from abroad and if so, what measures they recommend.

2. The principal markets in India which rely on imported salt are the Bengal and the Burma markets. The Board proposes to commence this enquiry by investigating conditions in India, leaving for consideration at a later date the problem of imported salt in Burma. The import of fine white crushed salt from abroad into Bengal is about 120 lakhs of maunds and of white uncrushed salt (kurkutch) about 12 lakhs of maunds annually. In the main therefore the problem before the Board is to determine whether it is desirable in the national interest that steps should be taken to encourage the production of fine white crushed salt in India.

3. It is first necessary to consider whether there are any localities in India suitable for the production of this class of salt. In this connection a considerable amount of exploratory work has already been done and after a consideration of the material before it the Board believes that the most suitable method of initiating the enquiry will be by investigating the possibilities of the principal centres of

salt manufacture, of which Karachi and Sambhar Lake are stated to be the most important within the Continent of India. Since the cost of manufacture is a factor of the utmost importance in determining whether the country's interests will be best served by the manufacture in India of salt at present imported from abroad, the Board will first direct its attention to this aspect of the problem. It will also consider the agency by which manufacture can best be undertaken, that is to say, whether a system of Government manufacture as at Sambhar or a system of private manufacture under Government supervision, such as at present prevails at Karachi, will best conduce to cheap production or whether these systems should be superseded by any other system. Further, since the cost of transport constitutes the largest item in the determination of the wholesale price of salt, the possibility of a reduction in freights must also be considered. In this connection the effects of large scale production must not be overlooked; for rates of transport are to some extent dependent on the quantity of freight offered and the regularity of shipment, while facilities for loading and handling which are not at present available, may prove feasible for large shipments.

4. The Board would be glad to receive the views of manufacturers who at present produce white crushed salt or contemplate such production on the points indicated above together with a statement in detail of their costs of production. Manufacturers who claim that protection should be extended to the production of fine white crushed salt, should also submit formal applications, stating the grounds on which protection is claimed, the extent of protection required and the form in which they consider that protection should be extended.

5. The Board hopes to visit Karachi in the second week of November and the Sambhar Lake early in December Representations from manufacturers (with five spare copies) addressed to the Secretary, Indian Tariff Board, Kindersley, Ootacamund, should be forwarded to reach the Board not later than September 30th.

6. On receipt of representations from manufacturers, the Board will be in a position to issue a general questionnaire and to arrange its tour programme in such a manner as to afford an opportunity for all those interested in the enquiry, both producers and consumers, to put forward their views on the subject."

3. A large number of representations were received in response to the Board's communiqué. A detailed questionnaire was then prepared and forwarded to interested persons. At the request of certain Chambers of Commerce a preliminary evidence volume containing all the principal representations and the replies to the Board's questionnaire was published for general information.

Publication of preliminary evidence volume.

4. In the course of the cold weather the Board visited and inspected salt works at:—

Board's tour.

Matunga,	Sambhar,
Okha (Mithapur),	Pachbadra,
Karachi (Maurypur),	Aden,
Khewra,	Tuticorin,

while in Calcutta the Board inspected the Government salt golas at Sulkea and had an opportunity of visiting two or three vessels which were unloading in the stream. In the company of the Director of Industries, Bihar and Orissa, the Board also went to Tua Island, Chilka Lake, where there is a project to erect a factory for the manufacture of fine white salt for the Calcutta market.

5. In addition to the representations of the applicant companies the Board examined the following persons:—

Oral evidence.

Mr. D. N. Strathie, I.C.S.

,, C. H. Masterman, I.C.S., Collector of Salt Revenue, Madras.

,, H. T. Sorley, I.C.S., Collector of Salt Revenue, Bombay.

Messrs. J. B. S. Thubron, C.I.E., Chairman, and W. P. Shepherd Barron, M.I.C.E., Chief Engineer, Karachi Port Trust.

Mr. G. R. G. Shipp, Superintendent of Salt Revenue, Karachi.

Messrs. A. L. Hoyle, I.C.S., Commissioner, Northern India Salt Revenue, C. H. Pitt, General Manager, Salt Mines, Khewra, A. D. C. McIver, General Manager, Rajputana Salt Sources, Sambhar and H. O'Donnell, Assistant General Manager, Sambhar.

Messrs. Govindnarain Lahoti, Rambilas Totla, Lakshmidas Dhawan and others representing the salt traders, Sambhar.

Messrs. Himat Singh, M. M. Sumer Chand and Manu Subedar representing the Jodhpur State.

Mr. Seth Gulab Chand, General Salt Merchant, Pachbadra City.

,, L. Dewan Chand, representing Messrs. Dewan Chand and Company.

Rai Saheb Ganendra Nath De, Salt Broker, Calcutta.

Messrs. G. N. Bower, Collector of Customs, Calcutta, F. Buckney, Superintendent, Preventive Service and Salt Department and M. N. Fitzgerald, Inspector, Preventive Service.

Messrs. M. A. Hughes and H. Webb, representing Messrs. Turner Morrison and Company.

Mr. F. G. Gould, representing Messrs. Grahams Trading Company.

Mr. W. C. G. Brodie, representing Messrs. Lionel Edwards, Limited.

Messrs. Marcel Grezoux and G. L. Savon, representating the Port Said Salt Association, Limited.

Mr. L. Anner, representing Messrs. Volkart Brothers.

,, A. Biggar, representing Messrs. F. W. Heilgers and Company.

,, E. K. Price, representing Messrs. Shaw Wallace and Company.

,, Kassim A. Mohomed, representing Messrs. Kassim and Ismail.

,, Valimohomed Kassam Dada, representing Messrs. Hoosein Kasam Dada.

Babu Ashutosh Sil, Salt Broker.

Messrs. A. R. L. Tottenham, C.I.E., I.C.S., and A. H. Lloyd, C.I.E., I.C.S., Members, Central Board of Revenue.

Mr. L. Mitchell, representing Messrs. Bird and Company.

,, N. O. C. Marsh, representing Messrs. Mackinon Mackenzie and Company.

,, W. J. Alcock, M. I. Chem. E., A. I. Mech. E., Consulting and Chemical Engineer.

,, N. Brodie, Superintendent, Government Test House, Alipore.

Messrs. Shorab R. Davan, N. M. Muzumdar and J. K. Mehta, representing Indian Merchants' Chamber, Bombay.

Mr. M. G. Kotibhaskar, representing the Maharashtra Chamber of Commerce, Bombay.

,, J. C. Rose, Deputy Chief Commercial Manager, Rates and Development, East Indian Railway.

,, R. A. Leaky, Superintendent, Rates and Development, Bengal Nagpur Railway Company, Limited.

Sir Ernest Jackson, Agent and Mr. H. P. Ball, General Traffic Manager, Bombay, Baroda and Central India Railway Company, Limited.

Mr. Vasudevan, Inspector of Salt, Tuticorin Circle.

,, M. R. N. Rama Pillai, Salt Merchant, Tuticorin.

We desire to acknowledge the assistance we have received from the above witnesses.

President's departure on leave.

6. Unfortunately the Board was deprived of the services of its President, Sir Padamji P. Ginwala, who proceeded on leave before the report had reached its final form. The general lines of the report however were discussed and agreement arrived at before his departure. A rough draft of the main chapters was prepared as a basis of discussion and the conclusions then reached were embodied

in a memorandum to which the President has appended his signature. This memorandum is reproduced as an appendix to this report. Since this memorandum was drawn up we have visited the salt works at Aden and Tuticorin, but have found no reason to vary the general nature of our conclusions. For the method of exposition and generally for the drafting of the report we hold ourselves responsible. The report as now presented was forwarded to the President and he has intimated by cable that he is in general agreement.

Report on the Salt Industry.

CHAPTER I.

The market.

The Bengal market.

1. Our terms of reference require us to consider whether it is desirable in the national interest that steps should be taken to encourage the production of salt in India suitable for consumption in those markets which are at present largely supplied from abroad. It is necessary therefore to ascertain the markets at present served by importers of foreign salt and the quality of salt imported. During the past three years imports of salt into India as shown in the seaborne trade returns have been as follows:—

	1926-27.	1927-28.	1928-29.
	Tons.	Tons.	Tons.
Bengal . .	462,406	496,789	533,434
Bombay . .	267	250	252
Sind . . .	106	82	69
Madras . .	29	61	106
Burma . .	78,962	99,068	80,966
TOTAL .	541,770	596,250	614,827

It will be seen that the foreign salt trade is confined almost entirely to the Bengal and Burma markets. Imports into other provinces are insignificant. They consist mainly of special kinds of table salt and for the purpose of this enquiry may be disregarded. Owing to the high prices prevailing in the years 1926 and 1927, the result partly of the coal strike in England, partly of subsequent market manipulation in India, imports were low and the normal demand for foreign salt may be placed at approximately 500,000 tons for the Bengal market and 80,000 tons for the Burma market. For reasons already given we propose to deal in this report with the problem of replacing foreign salt by Indian salt in India proper. The special steps necessary to meet the requirements of the Burma market are reserved for later consideration. Of the total imports of foreign salt into Bengal about two-thirds is consumed in Bengal and Assam and the remainder in Bihar, Nepal and the eastern portion of the United Provinces. Practically the whole of the salt consumed in Bengal and Assam is imported from outside India proper. An insignificant quantity of rock salt is supplied to this market from Khewra and a certain amount of brown solar salt of the most inferior quality is imported from Bombay. We have

been told that this Bombay salt is consumed mainly in the Nadia district for semi-religious reasons, the evidence indicating that it is used almost exclusively by widows. It is clear however from the figures given below that its consumption is conditioned largely by the price of foreign salt.

	1925-26.	1926-27.	1927-28.	1928-29.
	Rs.	Rs.	Rs.	Rs.
Average price of Aden salt per 100 maunds *ex*-gola.	58	78	99	87
Imports of Bombay salt in tons.	12,000	22,000	32,000	18,000

Classes of salt demanded.

2. Excluding table salt of various proprietary brands, the foreign salt imported into India may be divided into the following classes:—

I. Salt manufactured from brine by boiling or by the vacuum process.

II. White crushed salt manufactured by solar evaporation and subsequently ground to the required degree of fineness.

III. Rock salt.

IV. Crushed rock salt.

V. Kurkutch or uncrushed salt manufactured by solar evaporation.

I. The earliest method of salt manufacture in Europe was by boiling brine, obtained from brine springs, or wells, in shallow open pans. Very little progress appears to have been made in the process of manufacture until comparatively recently; in fact in England the Sub-Committee appointed by the Standing Committee on Trusts to enquire into the existence and effect of a ring in the salt trade, writing as late as 1920 found that " with the exception of some half dozen more or less scientific plants, the whole output is produced by the very old method of evaporation in open pans over coal fires ". Since the cost of manufacture depends very largely on the amount of fuel used to produce a given quantity of salt, attention has been directed principally to this aspect of the question and recent improvements in the processes and plant have aimed mainly at decreasing expenditure on fuel by increasing the rate of evaporation. This has been effected in most modern plants by creating a vacuum or partial vacuum over the heated brine, thus stimulating the rate of evaporation. In some of the more modern plants, as for example the Hodgkinson plant, it is possible to produce every grade of salt from the finest table salt to the coarsest fishery salt in one and the same operation and the subsequent grinding of crystals, indispensable in the older open pan system, has been eliminated. Salt manufactured by processes requiring the use of artificial heat is imported into India from Liverpool and Hamburg. This method of manufacture generally results in the production of a clean white salt. The brine from which it is produced is

obtained by pumping water through disused rock salt mines. It is therefore free from many of the impurities which are found in brine concentrated from sea water and in particular contains little or no magnesium chloride. In consequence, being free from hygroscopic salts, it has no tendency to absorb moisture and is therefore particularly suitable for the Bengal market. The characteristics of this class of salt are dryness, whiteness and evenness of grain.

II. White crushed salt manufactured by solar evaporation is imported mainly from Spain, Egypt and the Red Sea including Aden. It is obtained by the concentration of sea water in reservoirs or condensers. The concentrated brine is run from the condensers into crystallising pans. The bottom of the pans consists of hard clay carefully tamped until it presents an even non-porous surface. Each pan is surrounded by a low clay wall. The brine is allowed to flow into these pans to the required depth and is there evaporated by solar action until salt (sodium chloride) is precipitated. The salt is then collected, washed, dried and crushed in mills to the required degree of fineness. The colour of the salt depends largely on the nature of the soil of which the pans are constructed and the amount of care taken in scraping and collecting the salt. If the bottom of a pan is muddy, it is difficult to collect the salt crystals without also scraping up a certain amount of dirt. The purity of sea salt, that is its freedom from the other salts present in sea water such as magnesium sulphate, magnesium chloride, etc., depends on the care taken in supervising manufacture and in particular in testing the density of the brine at the various stages. The nature of the pan bed is also important since a semi-porous bed is liable to become saturated with magnesium chloride and salt collected from such a pan will contain a high percentage of magnesium chloride.

III. Rock salt is imported in very small quantities from Hamburg. It is stated to be used in religious ceremonies and is also used to some extent for cattle.

IV. Crushed rock salt is imported from Roumania. It contains a very high percentage of sodium chloride, is free from dirt and of a good colour.

V. Kurkutch or uncrushed sea salt is supplied mainly from Red Sea sources especially Aden and is composed of fairly large crystals. The market for this class of salt is comparatively restricted, about 10 per cent. only of the imports into Bengal being kurkutch. The nature of the preference for this salt is not easy to ascertain. It has been stated that it is used almost entirely for cattle; but we were informed by wholesale dealers in Calcutta that it is sold mainly in Nepal, where a system of sale by measurement prevails. As has been found in Madras the larger crystals commend themselves to dealers who purchase by weight and sell by measurement. Save in so far as there is a limited demand for brown Bombay kurkutch the market requires that kurkutch should be white in colour.

3. For the purpose of this report we consider it unnecessary to distinguish between fine white crushed salt and kurkutch. The market for the latter is small and the difference between the two classes of salt consists in the fact that the latter being uncrushed costs less to produce. Any measures which we may recommend for the encouragement of the production of fine white salt will therefore be equally applicable to the production of kurkutch, except in respect of the fair selling price, provided its sodium chloride content and colour conform to the general requirements of the market. The statement below gives the imports of salt into Bengal by sea during the last three years:—

Detailed statement of imports into Bengal.

TABLE No. 1.

	1926-27		1927-28.		1928-29.	
	Calcutta.	Chittagong.	Calcutta.	Chittagong.	Calcutta.	Chittagong.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Liverpool . .	12,73,533	14	20,35,348	11	17,79,322	44
Hamburg . .	12,02,840	...	7,14,094	...	6,07,910	...
Spain . .	9,88,424	1,81,260	18,11,625	2,78,569	13,24,520	3,22,498
Port Said . .	26,26,657	4,05,904	22,25,794	3,28,546	19,01,170	4,30,299
Massowah . .	14,77,453	...	12,97,412	...	13,05,050	...
Aden . . .	35,65,499	7,23,810	37,11,452	10,46,799	43,77,620	9,36,029
D'Jibouti . .	1,83,710	...	1,96,340	...	2,92,270	...
Bombay . .	6,02,018	...	8,73,786	...	4,92,772	..
Karachi . .	...	...	...	...	2,05,957	..
Tunis . .	...	...	...	...	6,62,295	...
Okha . . .	...	...	...	...	60,375	...
Roumania . .	..	...	...	...	1,91,965	1,17,270
Total .	1,19,20,134	13,10,988	1,28,70,851	16,53,925	1,32,01,226	18,36,140
	1,32,31,122 maunds. =486,438 tons.		1,45,24,776 maunds. =534,000 tons.		1,50,37,366 maunds. =552,844 tons.	

4. In order to enable us to determine to what extent Indian salt can be substituted for imported foreign salt in the Bengal market it is necessary to ascertain the quality and characteristics of the various classes of foreign salt now imported. We therefore selected from the Government salt golas at Calcutta specimens of the various

Analyses of imported salts.

classes of imported salt and arranged for their analysis at the Government Test House, Alipore. The results are as follows:—

TABLE No. 2.

—	Moisture loss at 140° C.	Matter insoluble in water.	Calcium chloride.	Magnesium chloride.	Sodium chloride.	Sodium sulphate.
1. Hamburg Vaca . .	0,17	0·45	0·30	...	98·64	0·44
2. Fine white Cheshire .	0·50	0·05	1·05	...	97·09	1·31
3. Hamburg fine . .	0·20	0·38	0·42	...	98·31	0·69
4. Fine white Massowah crushed.	3·53	0·10	0·73	1·32	92·72	1·60
5. Fine white Spanish crushed.	0 60	0·12	0·18	...	98·95	0·15
6. Aden solar fine . .	3·67	0 20	0·95	1·37	92 23	1·58
7. Indo-Aden fine . .	3·80	0·12	0·73	1·37	92·42	1·56
8. Aden fine . . .	3·53	0·09	0·71	1·20	92·86	1·61
9. Port Said crushed .	2 02	0·12	0 55	0·64	95 64	1·01
10. D'Jibouti crushed .	3·89	0·23	0·75	1·64	91·57	1·92
11. Little Aden kurkutch	3·38	0·17	0 95	1·02	93 93	0·55
12. Aden kurkutch .	5·90	0·07	0·65	1·98	89·43	1·97
13. Hamburg rock . .	0·18	0·03	0 22	0·38	99·36	0·13
14. Roumanian fine (Rock) ground.	0·10	0·04	0·16	...	99·47	0·23

N.B.—In these analyses the calcium oxide and magnesium oxide determined have been calculated as calcium chloride and magnesium chloride respectively. The sulphuric anhydride has been calculated as sodium sulphate. The sodium chloride has been determined by difference. Bromides and iodides have been looked for in each sample and found to be absent.

On these analyses imported salt falls into two classes. The first class comprises salts manufactured by artificial heat such as Cheshire (known in the market as Liverpool salt) and Hamburg vaca and also natural rock salt such as Hamburg and Roumanian. The sodium chloride content of these is very high and in particular there is an absence of magnesium chloride and of moisture. All solar salts fall into the second class and though differing in their sodium chloride content, their comparatively high percentage of moisture and impurities distinguishes them from salts of the first class.

Impurities.

5. As indicated above the impurities contained in imported salt consist of calcium and magnesium salts, sodium sulphate and matter insoluble in water. So far as we have been able to ascertain the presence in such small quantities of these salts is not injurious to health. At the same time all are to some extent hygroscopic and it will

be observed from the table given above that the percentage of moisture contained varies very much in proportion to the percentage of salts other than sodium chloride. Magnesium chloride in particular absorbs moisture very readily and a large percentage of this salt renders grinding a matter of great difficulty. Generally the effect of the presence of magnesium and other salts save in minute quantities is to render salt unsuitable for table purposes in that it absorbs water, is liable to cake and cannot be sprinkled easily. Since in Bengal the consumer requires a dry salt, there has always been a preference in this market for boiled brine salt. The first requirement of the Bengal market is a pure and consequently a dry salt.

Colour.

6. Another characteristic of boiled brine salt is the whiteness of its colour. In the following table are given the colours of the different samples of salt as measured at the Government Test House, Alipore, by the ' Dubosq ' colorimeter.

TABLE No. 3.

Description of sample.	Yellow.	Red.	Blue.
1. Hamburg Vaca . .	0·1	0·05	...
2. Fine White Cheshire .	0·3	0·05	...
3. Hamburg Fine . .	0·2	0·2	...
4. Fine White Massowah Crushed . . .	0·4	0·3	...
5. Fine White Spanish Crushed . . .	0·4	0·3	..
6. Aden Solar . . .	0·7	0·7	...
7. Indo-Aden Fine . .	0·8	0·7	0·2
8. Aden Fine . . .	0·6	0·5	...
9. Port Said Crushed .	0·5	0·3	0·1
10. D'Jibouti Crushed . .	0·4	0·3	...
11. Little Aden Kurkutch .	0·9	0·8	0·2
12. Aden Kurkutch . .	0·6	0·4	...
13. Hamburg Rock . .	0·3	0·3	...
14. Roumanian Fine . .	0·3	0·2	...

N.B.—The above table shows the results obtained by the application of the colour test to the samples as taken from the golas. They should therefore generally correspond to the condition of the various salts as sold in the market.

It will be observed that while natural rock salt and brine salt manufactured by artificial heat do not exceed 0·3 of any one colour, the percentage for solar salts is very much higher. Since the sodium chloride content of solar salts is in the main lower than that of brine and rock salts, it may be stated that generally the percentage of colour varies inversely with the sodium chloride content. It has been comparatively easy in the past to distinguish Cheshire and Hamburg salts by a casual inspection and since the characteristic of this class of salt is the absence of colouring matter, the market has always insisted on a high

standard of whiteness and has rejected all salt which does not approximate to this standard.

Grain.

7. Another characteristic of boiled brine salt is the evenness and fineness of its grain. This is exhibited in the table below which gives the percentages retained on sieves of varying mesh :—

TABLE No. 4.

Description of sample.	Size of sieve (mesh per inch).						
	5	10	20	30	50	100	200
1. Fine White Cheshire .	*Nil*	0·1	1·3	32·5	87·9	98 7	99·6
2. Hamburg Vaca . .	*Nil*	*Nil*	0·4	9·0	58·0	91·7	98·6
3. Hamburg Fine . .	0·3	3·9	30·1	51·1	71·4	87·6	97·2
4. Fine White Spanish Crushed. .	0·6	2·8	54·2	80·6	92·1	97·2	98·3
5. Roumania Fine . .	0·8	8·2	34·6	51·4	67·6	84·0	95·2
6. Port Said Crushed .	*Nil*	2·8	46·6	76·4	93·0	97·6	97·6
7. Fine White Massowah Crushed.	0·1	5·3	44·5	70·7	96·2	99·6	99·6
8. Aden Solar Fine . .	*Nil*	3·2	43·6	77·0	97·4	99·2	99·3
9. Indo-Aden fine . .	0·3	8·6	49·7	78 7	93·4	98·1	98·1
10. Aden Fine . .	2·7	7·5	50·8	78·6	90 8	97·8	98·9
11. D'Jibouti Crushed .	0·2	7·5	49·7	82·8	94·0	99·3	100·0
12. Aden Kurkutch . .	70·1	93·1	98·0	99·0	99·4	99·6	99·6

It will be observed that while in the case of many solar salts, the grains are retained in the larger meshed sieves in varying degrees, in the case of fine white Cheshire practically no grains are retained until a mesh of 30 to the inch is reached, while a very large proportion is retained on a 50 mesh. In the case of Hamburg Vaca, the size of the grains is somewhat smaller but the evenness is about the same. The market prefers a grained salt and very finely powdered rock salt such as Hamburg fine or Roumania is not held in such esteem as the boiled salts.

General characteristics and market preference.

8. The qualities then which determine the market preference in regard to salt are those characteristic of Liverpool salt, *viz.*, whiteness, evenness of grain and absence of moisture. There are historical reasons for this preference. Before the advent of British rule salt was manufactured in Bengal from sea water. The salinity of sea water along the coast of Bengal is much reduced by the admixture of fresh water from the Ganges, Brahmaputra and other rivers. The low salinity of the sea water

of the Bay of Bengal and climatic conditions combined to make boiling the only possible process of manufacture in this part of the country. A system of monopoly was developed by the East India Company and survived till 1862. But by 1835 Cheshire salt began to find its way to Calcutta, where partly owing to its superior quality and cheapness and partly perhaps as a result of the direct encouragement of the East India Company its sale rapidly extended. In 1863 Government abandoned the monopoly and local manufacture was permitted subject to an excise duty. Owing to the weakness of the brine supply, lack of fuel and other natural disadvantages, the cost of production of local salt far exceeded the selling price of imported salt and in 1898 local manufacture was entirely prohibited. Since that time, the Bengal salt market has been supplied almost entirely from foreign sources. The Bengal consumer therefore has been accustomed for centuries to a boiled and consequently a white salt. For very many years the bulk of the salt imported into Calcutta was Liverpool salt and it is this salt which still furnishes the standard by which the quality of other classes of salt is determined. The market is prepared to accept any given salt in proportion as it displays the qualities of Liverpool salt, *viz.*, whiteness, evenness of grain and absence of moisture.

Price as a factor in market preference.

9. It will be apparent from the foregoing discussion that the characteristics which the Bengal market looks for are those generally associated with boiled brine salt as represented by Liverpool salt. It would however be misleading to suggest that the preference of the market is necessarily for boiled salt as distinct from solar salt. What the consumer in Bengal wants is a class of salt which possesses more or less the characteristics which he has learnt to appreciate through long use of Liverpool salt. To the extent that various classes of solar salt have shown the same qualities he has by no means been averse to taking them. On the other hand, in many cases he has preferred solar salt considerably inferior to Liverpool salt provided the price is lower and these characteristics are present in a reasonable measure. In fact it is true to say that subject to a certain minimum standard of quality the most important factor in regulating the demand for the various classes of salt is the question of price. The preference of the Bengal consumer for a fine white salt is so marked that the view has sometimes been advanced that nothing short of the exclusion of foreign salt will be effective in diverting consumption to inferior grades and in support of this view it is pointed out that during the war when the price of fine white salt in Bengal was frequently well over Rs. 200 per 100 maunds, the import of Madras salt did not exceed four lakhs of maunds a year. This view, however, is only partially true. The exclusion from the Bengal market of a class of salt so inferior as Madras salt indicates that there is a minimum standard of quality and appearance on which this market insists. But this is no evidence that better classes of salt approximating in varying degrees to

Liverpool salt would necessarily be excluded irrespective of price. At the end of last century Liverpool held an almost undisputed position in the Bengal market, about 75 per cent. of the salt imported being from the United Kingdom. The table below gives the share of each source of supply in the Bengal market during the last two years:—

TABLE No. 5.

Name of source.	Percentage.	
	1927-28.	1928-29.
United Kingdom	14·02	11·83
Hamburg	4·92	4·04
Spain	14·39	10·95
Port Said	17·59	15·51
Massowah	8·93	8·67
Aden	32·75	35·34
D'Jibouti	1·35	1·94
Tunis	...	4·40
Roumania	...	2·26
Bombay	6·05	3·28
Okha	...	·41
Karachi	...	1·37

This diversion of custom from Liverpool salt cannot be explained on any ground other than that of price. For an examination of Tables 2, 3 and 4 (paragraphs 4, 6 and 7) reveals that in all essential qualities Liverpool salt is markedly superior to the Red Sea salts, in the import of which there has been so large an expansion. It has not been easy to ascertain with any precision the course of prices during the whole of the last 30 years but from such information as we have been able to obtain it appears that during the whole of this period Liverpool salt has stood at a premium in price as compared with salt from other sources. The amount of this premium has varied at different times. It has on occasions stood as high as Rs. 20 per 100 maunds; but speaking generally, it may be said that the price of Liverpool salt has exceeded that of Red Sea salts by Rs. 7 to Rs. 8 per 100 maunds. With this difference in price Liverpool has in 30 years lost most of its market in Bengal. We were informed in Calcutta that the intrinsic difference in value between Liverpool and Red Sea salts is about Rs. 3 per 100 maunds and that, had the premium never exceeded this sum, it would have been possible for Liverpool to have retained the whole or the greater part of the Bengal market. Red Sea salts compare unfavourably with Liverpool salt in quality. Their moisture content is high, their sodium chloride content low; the grain is uneven, while as regards colour, it is doubtful whether some of the Aden salt which we saw in the golas during our visit

to Calcutta could properly be described as white salt. Yet in thirty years a comparatively small difference in price has been sufficient to divert the market very largely to this class of salt.

Our conclusion therefore is that the qualities which determine whether a salt is suitable for consumption in the Bengal market are its whiteness, dryness and the evenness of its grain. The degree in which these qualities are required is to a very considerable extent conditioned by the price and generally speaking the market prefers a crushed solar salt of the Aden type when the difference in price between this and a superior brine salt is appreciable.

Price variations: I.—Influence of freights.

10. In our previous enquiries we have endeavoured, as far as possible, to determine the normal level of price of the imported article and, by comparing this with the fair selling price of the home product, to ascertain the measure of assistance required by the Indian industry. But the difficulties which must always be encountered in attempting to determine a normal standard of price for any imported article are intensified in the case of salt. One factor in particular which makes for variation in import prices is the level of freight charges. This in the case of most commodities constitutes but a small percentage of the ultimate price. Freight charges for salt however constitute approximately half of the ultimate landed price of the bulk of imported salt and any considerable variation in these charges must seriously affect the price of salt. Apart from the normal operation of economic forces the principal factors affecting the freight market in the last 30 years have been the war, the operation of shipping rings and combines and the coal strike of 1926. We have been supplied by the Indo-Aden Salt Works with a statement showing the steamers chartered and the freights paid by them from Aden for the years 1911-29. In the year 1911 freight stood at Rs. 5 per ton; in the succeeding two years it stood fairly constant at an average figure of slightly over Rs. 6 per ton. But in 1914 it fell as low as Rs. 3-8 rising with the outbreak of war to Rs. 6-8 per ton. During the war freights steadily rose, the highest figure being Rs. 29 a ton in 1917. By 1920 freight had again fallen to Rs. 11 per ton. This fall continued with slight variations until by 1926 the figure stood at Rs. 6 per ton. With the coal strike of 1926 a rise again occurred and continued till March 1927 by which time freight charges stood at Rs. 10 per ton. In 1928 the average level of freight was about Rs. 6-8 per ton and the latest charge from Aden in October 1929 was Rs. 7-14 per ton. These figures will give some idea of the extent to which the level of freights affect the price of imported salt. But comparing the level of freights and the import prices in the same years it appears that though an increase or decrease in freight if continuous tends to be reflected in the price of salt, this is not always the case nor is the variation in any way proportional. We must look to other influences to explain the variations in price which are a characteristic of the Calcutta market.

11. The first of these is the tenacity with which manufacturers supplying the Calcutta market have clung to that market and attempted to exclude all newcomers. In fact it would appear that the intrusion of any new manufacturer has been the signal for a price war. A noticeable reduction in prices followed the advent of Aden salt in 1903. Again at the end of 1911 when the Indo-Aden Works first commenced to import the price of Liverpool salt which had previously stood at Rs. 71 per 100 maunds was at once reduced to Rs. 41 per 100 maunds. Such price wars have never been completely successful in effecting their purpose and accordingly by March 1912 we find the price of Liverpool salt again standing at Rs. 69 per 100 maunds. Attempts to exclude newcomers from the Calcutta market and to stabilize the price of salt, usually at a high level, have sometimes been carried out by informal agreements between manufacturers or importers, sometimes by the establishment of formal associations. An association of importers was formed in 1911 in connection with the import of Indo-Aden salt which is thus described in the Administration Report of the Salt Department for Bengal in 1911-12:—

II.—Influence of combines of manufacturers.

> "The Collector of Customs reports that a combine was formed with the object of maintaining prices at a high level and of obviating the cutting of rates to which competition gives rise. The result was that prices ruled high and there was a temporary holding off of purchasers until more normal conditions occurred. In December 1911 an importation of Aden salt was introduced into the market and the combine was forced to lower its prices in its endeavour to exclude the intruder. Liverpool, Hamburg and Saliff salt dropped as much as Rs. 30 per 100 maunds in the course of a fortnight."

A similar combine was formed about 1918 but regarding its activities we have not been able to obtain any information.

12. The latest combine formed to operate in the Calcutta market, *viz.*, the Salt Importers' Association of Bengal, came into existence on 17th February, 1927. At that time, owing to the coal strike in England in 1926, the price of Liverpool salt stood very high. Early in 1926 the price stood between Rs. 62 and Rs. 65 per 100 maunds but by October it had been forced up to Rs. 122, the price of other salts rising in proportion. The Association comprised as its members—

The Salt Importers' Association of Bengal.

1. The Salt Union of Liverpool, through its Agents, Messrs. Turner Morrison and Company, Calcutta.
2. The Union Salinera de Espana of Barcelona, through its Agents, Messrs. Turner Morrison and Company, Calcutta.

3. The Societa Italiana pur le Saline Eritree of Rome, through its Agents, Messrs. Turner Morrison and Company.

4. Hamburg Salt Interests, through their representatives, Messrs. Lionel Edwards, Limited, Calcutta.

5. The Port Said Salt Association Limited, through its Agents, M. Grezoux, Calcutta.

6. Augostino Burgarella Ajola of Aden, through its Agents, Messrs. Grahams Trading Company, Limited, Calcutta.

7. Indo-Aden Salt Interests through their Agents, Messrs. A. & J. Lalljee, Calcutta.

The objects of this Association as stated by its Secretary are as follows:—

"To prevent violent fluctuations in prices whereby speculation is stimulated and to regulate the supply in accordance with the demand. Since the Association was officially started on 1st March, 1927, when its secretarial work was undertaken by the staff of the Bengal Chamber of Commerce its representatives have met once a week in the rooms of the Bengal Chamber of Commerce, Calcutta, to review the positions of the different members in regard to their cargoes in port and to arrive as well at stocks in bond, with a view to regulating imports to meet market requirements, and each member has a certain percentage of that allotment according to the agreement. These shares are either reduced or increased according to the extent to which members are oversold or undersold at the time of each meeting."

Manipulation of prices by the Association.

13. Whatever the intentions of the Association, it is quite obvious that the immediate result of its operations was to maintain an unduly high level of prices throughout 1927 and the first three quarters of 1928. By April, 1927, freights had already commenced to fall; the Indo-Aden Company which in March, 1927, paid Rs. 10 per ton freight was able to ship its salt at a freight of Rs. 8 per ton in July and Rs. 6-4 per ton in November. Notwithstanding this the Association were able to maintain a price of Rs. 118 per ton for Liverpool salt in April. In June the price was raised to Rs. 122 and kept at that level till November of the same year. The price of other salts was proportionately raised, the price of Aden salt being normally between Rs. 6 and Rs. 7 below that of Liverpool. The table below shows the complete course of prices since the formation of the Association.

TABLE No. 6.

Meeting Date.	Liverpool.	Hamburg Vaca.	Hamburg Pine.	Spain.	Port Said.	Massowah.	Aden.	Indo-Aden.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
4th March, 1927 .	118	114	103	103	101	101	101	100
6th April, 1927 . .	118	114	112	110	108	108	108	107
22nd April, 1927 .	118	116	114	110	108	108	108	107
8th June, 1927 . .	122	121	120	118	116	116	116	115
21st September, 1927	122	120	118	118	116	116	116	115
26th October, 1927 .	122	121	119	118	116	116	116	115
18th November, 1927	107	106	104	103	101	101	101	100
4th July, 1928 . .	108	107	105	104	102	102	101	100
15th August, 1929 .	80	79	77	76	74	74	73	72
30th January, 1929 .	80	79	73	72	69	67	66	65
6th February, 1929 .	80	79	73	72	68	67	66	65
20th February, 1929	80	79	69	68	66	66	66	65
27th February, 1929 to 20th November, 1929.	80	79	70	69	67	66	66	65

Some idea of the effect of the coal strike and subsequent manipulation of prices by the Association may be obtained from the following figures:—

Period.	Estimated average increase per 100 maunds over normal price.	Consumption during period: lakhs of maunds.	Estimate of increased cost to consumer.
	Rs.		Rs.
1926 (2nd half) . .	40	60	24,00,000
1927	50	120	60,00,000
1928	35	120	42,00,000
		Total .	126,00,000

The normal price has been taken at Rs. 65 per 100 maunds Liverpool salt which was the price level at the commencement of 1926 and approximately the average level of the preceding year. In the absence of complete information as to the quantities of each salt sold and the price obtained for each consignment it is obvious that no exactitude can be claimed for these figures. There can however be no reasonable doubt that making allowance for the increase in freight and in the cost of production of Liverpool salt due to the coal strike in the course of the three

years not less than Rs. 1 crore in excess of what may be considered the normal price at this period was obtained from the Calcutta market by manufacturers of imported salt.

Failure of the Association.

14. The Conference appears to have been partially successful in eliminating variations in price due to irregular or ill timed import during 1927-28. But its success was conditional on immunity from competition from without. In the existing conditions of over-production of salt throughout the world this could not continue. In August, 1928, the arrival of a shipment of Roumanian salt forced the combine to reduce their prices by a sudden cut of Rs. 28 per 100 maunds. Liverpool salt was fixed at Rs. 80 per 100 maunds in the hope that the newcomer would find the business unprofitable. This hope was not realised and Roumanian salt has continued to be imported. Meanwhile new salt works have been established in the Sudan and Somaliland which look to India for their market. It is therefore exceedingly improbable that the Salt Association would have been able to maintain prices even at this level, but in January, 1930, owing to dissensions among the members the Association was dissolved. A considerable drop in prices has resulted and the price of Liverpool salt at present stands at Rs. 71 *ex*-ship.

Speculation due to irregular shipments.

15. Prices are also affected by the irregularity of arrival of salt shipments. Thus if three ships all carrying salt of approximately similar quality arrive at the same time, the *ex*-ship price may fall. On the other hand if after a considerable interval when orders have accumulated a cargo of salt arrives, the *ex*-ship price goes up and this increase is often passed on by speculators to the *ex*-gola deliveries of other salts. This price instability is intensified by the fact that although many kinds of imported salt are in quality much the same, the market distinguishes between them according to the locality of manufacture. There is thus a considerable number of different salts on the market each with its own dealers and supporters and the price of any one of these is regulated by the relation between the visible supply of that salt and the accumulation of orders. Variation in the price of any one class of salt is reflected in the prices of other classes and the opportunities for speculation are thereby increased. The three factors then which make for instability of prices in the Calcutta market are freight variation, the operation of rings and combines and speculation. In existing circumstances therefore any attempt to determine a normal price of imported salt would manifestly be fruitless.

OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY.

CHAPTER II.

Production in India.

16. India produces about 14 lakhs of tons of salt annually or roughly about three quarters of the total salt consumed in the country. With the exception of about 100,000 tons produced from the mines in the Punjab Salt Range, the whole of this output is obtained by the solar evaporation of sea water or brine. About one-third is produced in Madras, one-third in Bombay including Sind and one-third in Northern India. But of this salt far the greater portion is unsuitable for the Calcutta market. Bombay salt is brown, generally large grained with a high proportion of magnesium chloride and other hygroscopic salts. Madras salt also is generally large grained and dirty and contains a large percentage of moisture. Salt from either of these provinces is not accepted in any quantity by the Bengal market. Even during the war when the price of Liverpool salt reached the high price of Rs. 430 per 100 maunds, Madras salt though generally sold at not more than half the price, was never accepted as a substitute; the largest amount imported during the war in any one year was under four lakhs of maunds or about 4 per cent. of the total imports. Apart from the colour the high proportion of hygroscopic salts contained both in Bombay and Madras salt renders crushing difficult and expensive and the market for uncrushed salt in Bengal is small. We give below the analysis of a sample of Tuticorin fine grained kurkutch taken by us from the salt golas in Calcutta. For comparison we give also the analysis of a crushed Aden salt. These analyses were made in the Government Test House, Alipore and are calculated on a dry basis.

Present production: quality unsuitable.

	Tuticorin.	Crushed Aden.
Moisture (loss at 140° C.) . . .	8·56	3·80
Matter insoluble in water . . .	1·54	·12
Calcium chloride	1·31	·73
Magnesium chloride	3·71	1·37
Sodium chloride	81·07	92·42
Sodium sulphate	3·81	1·56

17. In Madras the manufacture of salt is mainly in the hands of private individuals. The systems in force in that province are three, *viz.*:—

Agency of manufacture: Madras.

Monopoly system.—Under this system manufacturers are licensed and must sell their salt to Government on the storage ground at a fixed price. The quantity to be bought is notified by Government at the beginning of the season.

Excise system.—Under the excise system licensees are free to manufacture and sell whatever quantities of salt they please at the best price they can obtain subject to the payment of excise duty. Government provides the staff to collect the duty and also exercises some control over the processes of manufacture merely with a view to ensure a reasonable standard of purity.

Modified Excise system.—The modified excise system differs from the excise system only in one respect namely that the licensee may be required at any time before the commencement of the season to sell the whole or a portion of his salt to Government.

In all three cases Government have the power to control quality as well as to fix minimum quantities for manufacture. The number of salt works along the Madras coast is considerable and although the number has in recent years been somewhat reduced, there are still some sixty factories in existence. Price is determined by competition among private manufacturers. The number of these being so large competition is intense and speaking generally prices throughout Madras have usually been at a reasonable level.

Bombay.

18. There are numerous salt factories scattered along the sea coast of Bombay and with the exception of the small Government works at Dharasna these are entirely in the hands of private manufacturers working under the excise system. Salt is also manufactured on a large scale by Government agency from subsoil brine at Kharaghoda and Udu on the border of the lesser Runn of Cutch. This salt is known as Baragra salt. Manufacture is in the hands of local salt makers (agarias) from whom all salt which conforms to the required standard is purchased by Government. Salt is also made by the Dhrangadhra State at Kuda and, under agreement with the State, Government purchased 5 lakhs of maunds annually for 5 years from 1923-24. The total output of salt in the Bombay Presidency (excluding Sind) during the last three years was as follows:—

	Kharaghoda.	Dhrangadhra.	Sea salt.	Total.
	Maunds.	Maunds.	Maunds.	Maunds.
1926-27 . .	12,64,079	3,93,204	97,32,406	1,13,89,689
1927-28 . .	20,30,261	3,10,200	99,22,200	1,22,62,661
1928-29 . .	27,55,298	...	1,09,77,318	1,37,32,616

Sind.

19. In Sind the main centre of manufacture is at Karachi. Until recently Government undertook manufacture at its works at Maurypur some seven miles west of Karachi. Recently the modified excise system has been introduced and the Government works have been handed over partly to the Laxmi Salt Works, partly to the local salt manufacturers known as lunaris (Moon Salt Works). An

area about a mile and a half to the south east of the Government Salt Works has been leased to a private individual and is now being worked by a limited company (the Grax Salt Works, Limited). There are also natural deposits of salt of a very high quality at Darwari and Saran in the Thar Parkar district. Owing to the absence of communications, these are only worked on a very small scale by Government.

Northern India.

20. The chief sources of supply for Northern India are the salt mines at Khewra and Warcha in the Punjab Salt Range and the Salt Works at Sambhar, Pachbadra and Didwana in Rajputana. There are also mines at Kalabagh and quarries at Kohat but their output is comparatively small. Except at Kohat, where the quarries are held by private individuals working under an excise system, salt mining is entirely in the hands of Government. Manufacture is also in the hands of Government at the Rajputana sources of supply. Salt is made by solar evaporation from brine which at Pachbadra is obtained from wells and at Sambhar from the salt lake. Throughout the whole of Northern India excepting Kohat therefore Government holds a monopoly of manufacture and has the means of regulating prices in the first instance.

Methods of manufacture of solar salt.

21. The methods of manufacture of solar salt are essentially the same in all parts of India though variations occur in the size and construction of pans, and in the methods of irrigation. Brine is obtained from the sea or from pits sunk in saliferous areas. The density of the brine determines the subsequent operations. At Kharaghoda for example and in some of the works at Karachi and Tuticorin the natural strength of the brine is such that no further concentration is necessary before it is run into the crystallizing beds. In most works, however, some condensation is necessary. In Madras sea brine is distributed through a network of irrigation channels, from which it is baled into condensing beds until it reaches the degree of density at which salt begins to deposit. In Bombay, Sambhar and on a larger scale at Okha the necessary degree of density is obtained by concentrating the brine in reservoirs. Sodium chloride normally commences to be precipitated at about 24·5° Baumé and the brine is therefore usually concentrated to a density of 24° Baume before it is admitted to the crystallizing beds. Two distinct methods are employed for the irrigation of crystallizing beds.

1. *Single Irrigation.*—The salt bed is irrigated to the depth of about an inch. The brine is allowed to evaporate for three or four days until a layer of crystals is formed. The salt is then raked up with wooden scrapers and allowed to dry.

2. *The Accretion system.*—In this system after salt has commenced to deposit and the density of the brine has reached 28° to 29° Baume, additional brine is added from the condensers. This process is repeated, the number of irrigations varying in different localities according to climatic conditions. With each

irrigation, a separate stratum of salt is deposited. Collection takes place at varying intervals according to the practice in the locality. In Madras the crop is obtained in some localities in as short a period as one month. In Sambhar on the other hand, irrigation takes place throughout the whole season and a single crop only is obtained. At the conclusion of operations a thick crust of salt comprising several strata has been formed which is broken up for collection. These are the two principal methods of irrigation employed, though there are considerable variations in different localities, in particular as regards the density of the brine and the depth of the irrigation.

Characteristics of Indian salt.

22. Salt crystals may be distinguished by their size, their colour and their chemical composition. Smaller crystals are formed when crystallization is rapid. Formation is rapid if the solution is very concentrated. Rapidity of crystallization is also assisted by high temperature and the prevalence of strong winds, since crystallization in motion gives more rapid results than crystallization in repose. The size of the crystals therefore depends partly on climatic conditions, partly on the care exercised in irrigation and the frequency of scrapings. Since the Calcutta market requires a crushed salt, the size of the crystals is not of great importance for our purpose. Most salt crystals display a pinkish tinge while some and in particular the large grained Sambhar crystals have a bluish appearance. Such faint traces of colour, though apparent in the crystals, disappear when the salt is crushed. The chief cause of the discolouration of salt is the admixture of dirt. This may result from the character of the soil constituting the pan bed, the absence of care in preparation of the bed, careless scraping and collection of the salt, want of due precautions in storing or the prevalence of dust storms. Most of these are preventible causes but it is impossible to form any estimate of the cost of production of a white salt in those areas in which brown or discoloured salt is now produced.

Chemical Composition.

23. The principal salts dissolved in sea water are—

Calcium carbonate.	Potassium chloride.
Calcium sulphate.	Magnesium sulphate.
Sodium chloride (common salt.)	Sodium sulphate.
	Magnesium chloride.

The average density of sea water on the Indian littoral is 3·5° Baume. At 10° Baume calcium carbonate commences to separate out. When concentration reaches 17° Baumé, calcium sulphate commences to float on the surface of the liquid finally settling down to the bottom of the pan. Pure salt solution is saturated at 26° Baumé but in the presence of other dissolved salts sodium chloride commences to precipitate at 24·5° Baumé. Concentration should not be carried beyond 28·5° or at the most 29° Baume, since the salt which separates out beyond this stage is very

impure and difficult to separate from the magnesium chloride and other salts contained in the bitterns. Salt obtained from sea water between the densities of 24·5° and 28·5° Baume contains as a rule traces of calcium sulphate, magnesium sulphate and magnesium chloride. Most of these impurities remain on the surface of the crystals and a careful washing of the salt in weak brine removes a considerable proportion of them.

It will be seen therefore that the purity of solar salt depends largely on the care exercised in manufacture. The density of the brine requires careful watching throughout and in particular precautions must be taken to ensure that no salt is collected after the brine reaches a density of 29° Baume. A factor which affects the purity of the salt to a very considerable extent is the character of the soil in the crystallizing area. If the bed has not been properly tamped or if the soil is semi-porous, it becomes impossible to run off completely the bitterns left in the crystallizing pan after the collection of the salt. Magnesium chloride and other salts tend therefore to be deposited and to become mingled with the soil. Thereafter at subsequent scrapings these are collected with the salt. With a soil of this kind, it is impossible to obtain a pure salt. Trouble of this nature can be eliminated by the use of artificial beds made of cement or asphalt but the construction of such beds naturally results in higher manufacturing costs.

24. Our conclusion is that with sufficient supervision and due precautions, salt of a quality suitable for consumption in the Bengal market can be manufactured by solar evaporation in any part of India where a brine supply is available either from the sea or from subsoil sources. It remains to be seen to what extent it can be manufactured on a commercial scale and at an economic price. On the basis of the salt at present produced, it is obvious that in Madras and Bombay far more supervision over manufacture and more care both in the preparation of the beds and in the collection and washing of the salt would be necessary to produce the required quality. Further, the soil is as a rule not impervious and it would probably be necessary to construct artificial crystallizing beds which would result in a considerable increase in capital cost. Both in Madras and Bombay climatic conditions are adverse to continuous working. Owing to the monsoon and the periodic occurrence of storms or of winter rains the season is comparatively short. As compared with places such as Aden or Karachi, where manufacture is possible almost throughout the whole year, production must as a rule be on a much lower scale. Where the capital cost is high, as it must be if artificial beds are constructed, the incidence of overhead charges on a comparatively small production must necessarily be considerable. The same disadvantages apply to manufacture in Bengal with the added consideration that the strength of sea brine is there so weak that concentration must be a lengthy and costly process. We do not exclude the possibility of manufacture of salt in these areas by the introduction of modern plant and the employment of

Prospects of manufacturing white salt in India: Bombay and Madras.

the vacuum or some similar process; but we have no data on which to estimate the cost of manufacture in the conditions of this country. So far as the present method of manufacture is concerned, namely concentration by solar evaporation, it appears to us that neither Bombay nor Madras nor Bengal possesses any advantages for the manufacture of salt suitable for consumption in Bengal. It may be that in the case of the north of Madras and Bengal freight advantages may be sufficient to compensate for the drawbacks which we have already indicated. But in the absence of any definite information as to the probable cost of production we should hesitate to base any recommendations on the possibility of supply from these sources.

Tuticorin.

25. Probably the whitest salt manufactured in the Madras Presidency is that obtained at Tuticorin and it has been represented to us that the encouragement of salt manufacture in this locality may afford a solution of the problem before us. We obtained through the Collector of Salt Revenue, Madras, the cost of manufacture (including interest on capital) at six of the largest salt works at Tuticorin. These vary from 2 annas 9 pies to 2 annas 11 pies per maund and with this low cost of production it appeared *primâ facie* that the matter was one which required careful investigation. We therefore visited Tuticorin and in the course of our enquiries paid particular attention to two aspects of the case, *viz.*, the quality of the salt and the possibility of any considerable expansion of output. The salt which we saw at our inspection was kurkutch with fairly large crystals and of a good white colour. The colour, however, we were informed, is seriously affected by severe dust storms which occur during July. The sodium chloride content is lower than that of Karachi or Okha salt and the magnesium chloride content is often as high as 3 per cent. The salt is consequently damp and unsuitable for grinding. The high magnesium chloride content is caused partly by the character of the soil in the crystallizing pans, partly by the processes employed in manufacture. The clay forming the bed of the pans is softer than in Aden or some of the Karachi works. It is therefore difficult to eliminate the bitterns entirely and the bed tends to become impregnated with magnesium chloride, thus raising the percentage of that salt in subsequent scrapings. Bitterns are allowed to remain in the pans for four or even more scrapings. Little attention is paid to the density of the brine in the pans and the brine which in most salt works is never allowed to exceed 29° Baume is frequently retained until a density of as much as 35° Baume is reached. Since magnesium chloride commences to deposit at 29° Baume, its retention in the pans after this point is reached must react unfavourably on the quality of the salt. It appears to us therefore that without a radical revision in the methods of manufacture including possibly the use of artificial beds, salt suitable for crushing cannot be obtained at Tuticorin. The area at present comprised in the salt works is about 1,200 acres. Practically the whole available area is already taken up and not more than 70 acres suitable for salt manufacture remains. There is no possibi-

lity therefore of any considerable increase in the output by an extension of existing works or the formation of new works. The average annual output during the last five years was about 23 lakhs of maunds and the average sales were about the same figure. On these figures therefore there is little scope for export to the Calcutta market. A further point which must be taken into consideration is the high rate of freight to Calcutta and in particular the heavy charges for lighterage amounting to over Rs. 4 per ton. Taking these into account it appears that Tuticorin kurkutch salt could not be landed in Calcutta at a price equal to that at which the consumer may normally expect to obtain white crushed salt from abroad. But even if, as has been represented to us, some 30,000 tons of kurkutch salt could be made available for the Calcutta market at Tuticorin, it is clear that we could base no recommendations on this source of supply. About 500,000 tons of salt is required annually in Calcutta of which 90 per cent. is crushed salt. If India is to be made self-supporting in respect of salt of the kind required in Bengal, not only must the quality be such as to admit of crushing, but production must be on a far larger scale than is possible at Tuticorin. For the solution of the problem before us we must look therefore for other sources of supply.

26. There remain the salt factories in Sind, at Port Okha in Baroda State and the Government factories and mines in Northern India. Karachi has certain definite natural advantages for the manufacture of salt. Rainfall is slight and does not as a rule interrupt manufacture for more than two or three weeks in the year. Sea breezes as a rule prevail, which aid crystallization without depositing dust in any quantity. The soil in some areas is a hard clay: in the areas which have been worked for some years, *viz.*, the areas at present worked by the Luxmi and the Moon Companies, the soil when carefully rammed forms an impervious flooring for the crystallizing pans. With care an excellent salt can be produced, there being little or no admixture of dirt from the floor of the pans. Partly with the object of obtaining a cleaner salt, partly because in some areas the soil requires time to consolidate and form a satisfactory crystallizing area, the Grax Company has constructed cement pans. In the older works subsoil brine of a density varying from 12° to 18° Baume is obtained from pits and is irrigated direct in to the crystallizing pans. In the Grax works brine is obtained partly from the sea and partly from subsoil sources and is led through canals to the pumping station where it is raised into condensing reservoirs. When the density reaches 24° Baume, it is allowed to flow from the reservoirs to the crystallizing pans. For superior salt intended for the Calcutta market cement pans are used, while clay pans are used for second grade salt intended for local consumption.

Karachi.

27. The Darwari and Saran deposits are situated in the Sind desert. The depressions in which the salt is found are filled with water in the rains. As the water dries up it leaves a deposit of salt which is covered over by a hard layer of sand. Below this

Darwari and Saran deposits.

crust of sand which has to be broken up with pick axes is found a solid layer of pure salt. The salt is of exceptional purity containing as much as 99 per cent. sodium chloride. It is of a very white colour and when crushed is equal or superior to much of the salt at present imported into Calcutta. This source of supply is at present not connected by rail communication, the nearest station, Dhoro Noro on the Jodhpur Railway, being some 20 miles distant.

Okha Salt Works.

28. These works are situated at Mithapur on the Okhamandal Peninsula in the Baroda State. Most of the natural advantages claimed for Karachi are present here also. The tract is an open one and the wind velocity considerable and fairly continuous. Rain is scanty and the open season commences early in September and ends at the commencement of July. Manufacture here is on a somewhat different method from that employed in other parts of India. The system of manufacture is thus described:—

> "The layout of the works is divided mainly into (1) Marine Lakes,—outer and inner (sagar), (2) Reservoir (Talao), (3) Lagoons (Dhrappa), (4) Storage tanks (Khajano), (5) Condensers and Ponds (Tapavani), (6) Feed tank (Gamda), (7) First set of pans (kyars), (8) Circulating Tank (Havada), (9) Spraying Basin (Agasi), (10) Second set of pans, (11) Power House and (12) Mills. The sea water enters the outer marine lake twice a day at tide times and flows by gravity towards the inner marine lake, passing through the automatic gates which open and shut with the advancing or receding tides impounding during the tide time the maximum of sea water. The gradual evaporation of the sea water begins in the inner marine lake which is about one mile long. From the inner marine lake the sea water passes by gravity into a larger reservoir covering about 100 acres from which the further concentrated waters again pass by gravity through a long channel into a huge lagoon about a mile long. In this lagoon the density of the sea water is brought up to a high degree of concentration. The brine from the lagoon is made to pass into the storage tank which is about 90 acres in area. The flow of brine from the storage tank into the four condensers is regulated by turn-over sluices. The concentrated brine passing through the condensers takes a zigzag course till it is nearly saturated. Finally the brine is led over very shallow surfaces called ponds and then delivered to the pumping stations. Nine-tenths of the sea water which entered the marine lake from the sea by going over a passage of four miles has been evaporated by solar agency before it arrived at the pumping station. The saturated brine is lifted up by pumps specially designed for handling saturated brine and delivered into the Feed Tank. From the Feed

Tank it is led over the first set of pans made of asphalt surfaces. The saturated brine passing over these kyars deposits part of the salt it contains and then enters the Circulating Tank equipped with a powerful specially designed pumping plant. The saturated brine is sprayed through several nozzles. The brine then flows from the Agasi at great velocity into the second set of pans also made of asphalt surfaces. The salt deposits over these surfaces and the clear supernatent brine flows back into the Circulating Tank again to be picked up by the powerful pumps and re-circulated till it has given up very nearly its entire quantity of dissolved salt. The spent up brine (mother liquor) or bitterns are then passed on to another tank for the recovery of other by-products particularly magnesium chloride. The salt is lifted from the pans and carried by tip wagons to the platform where it is stacked near the mill. The dry salt is then passed on to the mill for crushing."

The advantages which these works possess are—

(1) Comparatively small cost of lay out owing to the existence of the system of submarine lakes which concentrate the brine and convey it by gravity to the works.

(2) Rapidity of concentration by the spraying process necessitating a smaller number of condensing pans.

(3) Railway communication. The Jamnagar and Dwarka Railway runs direct from the works to the port some seven miles away.

(4) Direct shipping from the pier at Port Okha. Ships up to 16,000 tons can lie alongside the pier at low tide.

So far very little salt has been made by the spraying process, which came into operation in November last. The salt so far shipped to Calcutta has been manufactured by the ordinary solar evaporation method. Theoretically the method of manufacture should ensure a pure and white salt, but it is as yet too early to determine whether the process will be commercially successful. The Company is developing another salt works at Okha Madhi in Okhamandal some 25 miles from Mithapur. Here the method of solar evaperation is followed. Owing to the additional cost of railway transport the cost of salt produced here for the Calcutta market must be considerably higher.

29. Sambhar and Pachbadra salt is extremely pure and owing to the absence of magnesium chloride in the brine very suitable for crushing. The Sambhar lake situated on the eastern side of the Aravali range on the borders of Jaipur and Jodhpur, is some 20 miles long and about 2 to 5 miles in breadth. The water draining in during the monsoon is at first fresh but quickly takes up salt from the silt and forms a strong brine. A large dam some 12,000 feet long has been constructed by Government with the object of conserving

Sambhar.

the brine. A modification of the accretion system is here in force. The brine is led into reservoirs and thence into prepared enclosures (kyars). By November or December the brine should reach saturation point 25° Baume. Salt is then allowed to precipitate until a density of 29° Baume is reached. The kyars are then replenished with brine and salt again allowed to form. The process of replenishment is continued till April when extraction is commenced. The crystallizing area is very extensive, the area of a typical crystallizing bed being twelve to fifteen acres. The salt forms in the shape of a deep crust of successive layers on the bed of the kyar. The crystals are usually very large and in the markets in which it is consumed the value of the salt depends much on the size of the crystals. Owing to the fact that the soil on which the kyars are constructed consists of a black and somewhat slushy clay, the salt is sometimes discoloured in the process of collection. It appears however that after crushing the salt would be at least as white as Indo-Aden fine.

Pachbadra.

30. The system of manufacture in Pachbadra differs from that in force in other parts of India. Pits are dug in the ground about 300 feet long, 50 feet wide and 10 feet deep. Into these brine of a density of 14° to 16° Baume percolates to a depth of about 3 feet. When the brine reaches a density of 25° Baume, branches of the thorny morali bush, which is plentiful in this locality, are thrown into the brine. These gradually sink and the salt crystallizes on them and on the bed of the pit. As evaporation takes place, more brine flows in of itself, the level remaining constant. A period of 15 months and sometimes as much as two years is allowed to elapse before the salt is collected. The salt is extremely white in colour, save when discoloured by sandstorms, and if crushed would be suitable for the Calcutta market.

Khewra.

31. Rock salt produced at the Khewra mines is placed on the market uncrushed. The salt is sold as it leaves the mine in the form of lumps of uneven size and generally of a reddish colour. We have had samples of this salt crushed by hand and it appears that the reddish colour disappears on crushing. According to the opinion expressed to us by Calcutta dealers, the salt is then in every way suitable for the Calcutta market.

Aden : Output.

32. So far we have considered the question of the manufacture of salt in India proper. It has however been claimed by Aden manufacturers that Aden constitutes a part of British India and that for the purposes of this enquiry Aden salt must be considered as Indian salt. The claim is one which we shall consider later. But it appears desirable in our preliminary survey of the Salt industry, to include some account of the conditions of manufacture and processes employed and of the extent to which production of salt in Aden admits of expansion. There are at present four salt works at

Aden. The names of the works and of the proprietors, the acreage leased and present production of each are given below:—

Name of works.	Proprietors.	Average acres.	Present production Tons per annum.
Aden Salt Works . . .	A. Burgarella . .	1,000	125,000
Indo-Aden Works . . .	Abdoolabhoy and Joomabhoy Lalljee.	900	75,000
Hajeebhoy Salt Works . .	Hajeebhoy Lalljee .	943	15,000
Little Aden Salt Works . .	Pallonjee and Brothers .	900	15,000
	Total .	3,743	230,000

Production admits of considerable expansion. With their present equipment the Hajeebhoy Salt Works claim that they can produce 50,000 tons, the Little Aden 30,000 tons and the Indo-Aden with slight additions 125,000. A total increase of 100,000 tons would thus be secured. In addition there is room for further extension in the neighbourhood of Little Aden and it appears to us that, if the market demand so required, an additional output not far short of 150,000 tons per annum could be secured.

Conditions of manufacture.

33. Climatic conditions at Aden are peculiarly suitable for salt manufacture. Rain seldom falls and speaking generally the whole year is open for manufacture. The locality thus has a considerable initial advantage over centres of manufacture in India, where owing to monsoon conditions manufacture has usually to be suspended for three months in the year. Temperature is high and uniform, as contrasted with Karachi and Okha where a considerable fall in temperature is registered during the cold weather. Strong winds prevail throughout the year affording great assistance to the process of crystallization and at the same time enhancing the rate of evaporation. Owing to the shallow nature of the lagoons, the initial density of the brine is frequently above the average density of sea water and at the Little Aden Works we noted that the density of brine drawn direct from the lagoon was as high as 8° Baume, against the average density of 3·5° for sea water. The soil consists of a hard stiff clay which forms an impervious bed for the crystallizing pans. With reasonable care in collection, the absence of soft mud ensures a very white

salt and makes it possible to drain the bitterns completely from the pans, thus reducing the percentage of magnesium chloride. Shipping facilities are good and it is possible in every case to load the barges direct from piers constructed by the various companies at their works.

Method of manufacture.

34. Brine is admitted through sluice gates direct from the sea or lagoon. Condensation is secured in the case of the Aden Salt Works partly by a system of submarine lakes, and partly by condensers. In the case of other works the brine passes through a series of condensers (generally three) until it passes into the storage tank at a density of 21-22° Baume. The brine is generally pumped into the condensers, oil engines (assisted in the case of the Aden Works by windmills) being employed. From the storage tanks the brine is admitted into the crystallizing pans as required. The accretion system of irrigation is employed, pans being worked on a two months' rotation. Great care is taken to test the density of the brine daily both in the condensers and the crystallizing pans. In the latter the density is never permitted to exceed 29° Baume. When that stage is reached, additional brine is admitted from the storage tanks. At the end of two months the crust of salt is broken up by hand with sharp spades specially designed for the purpose. Care is taken to leave approximately one inch of salt in the pan. This ensures that all the salt collected is clean and white. The salt is collected in heaps and allowed to dry. It is then stacked or removed to the mills to be crushed. Each works is provided with a very complete system of tramways enabling the salt to be transported rapidly and economically. Discharge into the barges for shipping is as a rule by hand, though at the Aden Salt Works conveyer belts are employed. Apart from the natural advantages enjoyed which, as we have indicated, are in some respects considerable as compared with Indian works, we were much impressed with the care taken in manufacture and in particular with the very complete nature of the lay out. It is obvious that the question of transportation and of shipping had received careful attention before the works were initiated. The accretion system employed tends to decrease labour costs while, as there is little or no rain, the risk of having the whole crop destroyed which prevents the adoption of this system in many parts of India is inconsiderable. Finally the adoption of a system of rotation ensures regular deliveries throughout the year.

Prospects of Indian Industry. I.—Quality.

35. It remains now to consider on a review of the possible outputs of these various sources how far India can supply the Bengal market. It appears to us that salt in no way inferior to the Red Sea salt at present imported into Bengal can be produced at Okha, Karachi, Khewra, Pachbadra and Sambhar. The Okha Salt Works, the Grax Works and the Luxmi Works are at present supplying salt to the Calcutta market. We have had specimens of Karachi and Okha salt from the Calcutta golas analysed at the Government Test House, Alipore, together with a

small quantity of Khewra rock salt crushed by hand. The results are shown below:—

—	Karachi Grax Vaca.	Okha.	Karachi common.	Khewra crushed.	Indo-Aden fine.	Fine white Cheshire.
Moisture (loss at 100° C) .	1·90	3·30	3·68	0·11	3·80	0·50
Matter insoluble in water .	0·17	0·35	0·72	0·12	0·12	0·05
Calcium chloride . . .	1·30	0·99	1·23	0·32	0·73	1·05
Magnesium chloride . .	0·45	0·63	0·31	0·26	1·37	*nil.*
Sodium chloride . . .	94·44	93·27	92·43	98·29	92·42	97·09
Sodium sulphate . . .	1·74	1·46	1·63	0·90	1·56	1·31

It will be seen that Karachi common is about equal to Indo-Aden fine, while Okha is slightly and Karachi Grax Vaca considerably superior. The Khewra salt sent for analysis was an average sample of rock salt picked up by us during our visit to the mine, and later crushed by hand. This salt compares favourably with Liverpool (Cheshire) salt and actually has a slightly higher sodium chloride content. As regards colour, the following are the results of the test—

	Yellow.	Red.	Blue.
Karachi Grax Vaca . . .	0·4	0·3	...
Okha (kurkutch) . . .	1·1	0·9	0·2
Karachi common (kurkutch) .	1·0	0·7	0·1
Khewra crushed . . .	0·2	0·3	...
Indo-Aden Fine . . .	0·8	0·7	0·2
Fine White Cheshire . .	0·3	0·05	...

All the above will bear comparison with Indo-Aden fine while Khewra is practically equal to Liverpool salt.

36. It appears then that salt of a quality suitable for the Calcutta market is at present being produced at several centres in India.

II.—Quantity.

The next point to be investigated is whether it could be produced in such quantities as to make India self-supporting in this respect. The amount at present imported into the Calcutta market is some 500,000 tons annually. Of this about 180,000 tons is imported from Aden. If Aden is to be regarded as part of British India for the purpose of this enquiry, there remains about 320,000 tons to be supplied from Indian sources. On the basis of actual production the amount which may be considered available for the Calcutta market would stand approximately as follows:—

	Tons.
Port Okha	5,000
Grax Limited	10,000
Luxmi Salt Works	7,000
Star Salt Works	3,000
	25,000

Although the present production is so small, the possibilities are considerable. If we were to believe the applicants, India is already on the verge of overproduction of fine white salt. In their representation, the Okha Salt Works, Limited claim to be able to expand their works within two years so as to produce 450,000 tons. Messrs. Grax Limited, Karachi, state that with slight extensions they will be able to produce 50,000 tons. Messrs. Luxmi Salt Works, Karachi, estimate their production at 12,000 tons. The Star Salt Works, Karachi, with an area of about 200 acres expect to produce 25,000 tons of which at least 15,000 tons is intended for export to the Calcutta market. There is an area of some 1,800 acres to the west of Beacon Hill of land still not fully developed. This area includes the Government Maurypur Salt Works and the Luxmi Salt Works. For the remainder Government has received several applications and should it eventually be utilized for salt manufacture a large outturn might be assured. Mr. J. A. Dunn in his report on the productivity of the Maurypur salt sources estimated that the whole area if worked continuously could produce about 200,000 tons of salt per annum. Though this output may be theoretically possible, it does not follow that production on this scale is a practical proposition and it would certainly be unsafe to conclude that within a few years this output will be attained. We prefer to proceed on the assumption that in the immediate future the supply of salt to the Calcutta market from Karachi and Okha will not exceed what the existing works with some small extensions may be expected to produce. Estimating on these lines we consider that it would not be unreasonable to anticipate the following output—

	Tons.
Okha	60,000
Grax Limited, Karachi	50,000
Star Works	25,000
Luxmi Salt Works	12,000
Total .	147,000

There remains a deficiency of rather over 150,000 tons. There are several sources from which this deficiency could be met. The Khewra salt mines at present produce about 100,000 tons annually, which is absorbed by the local market in rock form. As we have stated this salt if crushed is suitable in every way for consumption in Bengal. We were informed by the General Manager that without very great additions to the plant a further 100,000 tons could be produced. With some concession in railway rates, a matter to which we shall refer later, this in crushed form could be supplied to the northern and western portions of the area at present supplied with foreign salt. According to a report of the Geological Department the minimum reserve of salt in the Khewra mine is 4 million tons, but it is suggested that in all probability the ultimate total reserve will be found to be far greater than

this amount. Another source of supply is Pachbadra. This serves the same area as Sambhar and both sources must be considered together. Save in exceptionally good years it is not probable that a crop much in excess of 200,000 tons can be relied on at Sambhar and this would mostly be required to supply existing markets. There is however a considerable possibility of expansion at Pachbadra. The output in 1928-29 was about 20,000 tons but this has been raised to 50,000 tons in the current season. Even now out of about 1,000 pits only some 300 are working. It has been estimated by the Jodhpur State authorities that it would be possible to produce at Pachbadra about 50 lakhs of maunds annually or nearly 180,000 tons. On our inspection of the area we found that there was undoubtedly considerable scope for expansion and with a proper lay out it appeared to us probable that at least an additional 50,000 tons annually could be obtained. Pachbadra salt is consumed in the same areas as Sambhar salt and readily accepted by the same class of consumers. If therefore for administrative reasons it was not considered desirable to supply crushed salt direct from Pachbadra, the increased output could be utilized to replace Sambhar salt, releasing the latter for sale in crushed form in the Bengal market.

We estimate then that there is a reasonable probability that within a few years salt of a quality suited to the Calcutta market could be produced in the following quantities:—

	Tons.
Okha	60,000
Grax Limited	50,000
Star Salt Works	25,000
Luxmi Salt Works	12,000
Khewra	100,000
Pachbadra	50,000
	297,000
Aden	180,000
	477,000

It would appear therefore that even excluding from consideration the possibility of an appreciable output from the undeveloped area in Karachi or of enhanced production at Aden, which may amount to 150,000 tons annually, India should be able to produce in the near future almost the whole of the fine white salt at present imported from abroad. It does not however follow that the cost of manufacture of the whole of this production either at present or in the future will be such as to admit of sale at an economic price. This question and its bearing on the subject of the national interests served by the encouragement of the production of fine white salt in India will be considered in a later chapter.

37. It may be pointed out that our conclusion on the question of increasing the output of salt in India suitable for consumption in the Bengal market is materially different from that of the Central Board of Revenue as stated in their Report on the recommendations of the Taxation Committee. In paragraph 24 of the Report, the Central Board of Revenue arrived at the finding that it is impossible in the near future so to expand the output of salt in India as to render the country self-supporting. We have definitely rejected this finding for reasons which have already been explained. As regards Tuticorin we agree with the Central Board of Revenue that it offers little promise of development as a source of supply for the Bengal market. But as regards other centres of production we are unable to accept the reasons adduced by the Central Board of Revenue for rejecting them as possible sources for the supply of white crushed salt. The Central Board of Revenue found Karachi in many respects a suitable centre of manufacture, especially in respect of natural conditions and of freight. But they considered the available labour supply at Karachi insufficient for any substantial development and on this ground they regarded it as extremely doubtful whether Karachi could be utilised for supplying the Bengal market. They based their finding on the fact that there were only 120 families of lunaris who form the traditional class of salt workers at Karachi and that therefore it would be many years before skilled labour was forthcoming in sufficient numbers. When we were at Karachi, we discussed this point in detail with the salt manufacturers, and it was clear that there would be no difficulty in securing sufficient labour, if necessary, outside the class of lunaris. From the evidence of manufacturers who have had experience of labourers other than lunaris, we also found that the time required for these labourers to acquire the necessary skill was far less than was estimated by the Central Board of Revenue. In the Report of the Central Board of Revenue there is no reference to Okha as a possible centre of production and we imagine that the investigations of the Central Board of Revenue were conducted before the erection of a salt works at Okha was taken in hand and without a local examination of its possibilities. As regards the Government sources in Northern India, the Central Board of Revenue found the long railway lead to Calcutta and consequent prohibitive freights decisive reasons for ruling them out. In our opinion, as we have explained later in this Report, the question of railway freight on salt does not appear to have received adequate attention in the investigations held by the Central Board of Revenue. We have found no evidence, in particular, of any examination of the question whether a reduction in railway freights sufficient to enable Northern India salt to be placed in the Bengal market at competitive rates will result in such an expansion of the aggregate traffic of the railways as to yield a net increase in their earnings. The results of our examination of this subject are set forth in Chapter V and in the light of these conclusions we are unable to accept the view that the long railway lead is necessarily decisive against utilising-

Report of the Central Board of Revenue.

the Northern India sources for the Bengal market. In estimating the total quantity of Indian salt available for the Bengal market, we have provisionally taken into account the output of the salt works at Aden. The Central Board of Revenue, on the other hand, excluded Aden from their estimates of production on the ground that in considering the question of rendering India self-supporting, the inclusion of any salt works situated outside the continent of India and Burma would be far-fetched. Our reasons for including Aden are explained in Chapter VI. Briefly our view is that in considering the encouragement of the Salt Industry from the point of view of national advantages and not necessarily of discriminating protection it would not be wholly reasonable to exclude the salt works at Aden, most of which are financed by Indian capital and run by Indian skilled labour and from which substantial revenues are derived by the Indian Government. Even if it were decided to exclude Aden, our conclusion would not be necessarily vitiated. There are indications that the extent to which the output of salt, especially in the Government sources in Northern India, could be expanded is greater than we have estimated and pending a fuller investigation of the possibilities of the Northern India sources, it appears to us hardly consistent with the public interest to accept a conclusion adverse to the claim of India to be self-supporting in the matter of its salt supply.

CHAPTER III.

Costs of Seaborne Salt.

38. The answer to the question whether it is desirable in the national interest that steps should be taken to encourage the production of fine white salt in India must largely depend on the cost at which such salt can be produced. It is necesary, therefore, to examine in some detail the costs of production at the various centres which *primâ facie* appear suitable for the manufacture of salt of this kind. In this chapter we propose to deal with seaborne salt, that is salt manufactured at centres such as Karachi, Okha and Aden, which is conveyed to the Bengal market by sea. We have been supplied by most of the manufacturers with statements either of their actual or of their estimated costs. In the case of the works at Aden the figures represent actual costs incurred in the years specified and since the Aden Salt Works and the Indo-Aden Salt Works have already attained an economic output these figures may be taken as representing with accuracy the cost at which fine white crushed salt can be produced in Aden. In the case of the Indian works the position is different. In the past two years the Okha Salt Works have produced some 8,000 tons of salt by simple solar evaporation. The cost figures supplied to us by these works are based on an annual output of 60,000 tons, and must be treated as an estimate based as regards works costs on the cost of manufacturing salt by the ordinary process of solar evaporation and as regards overhead charges and profit on the capital cost required for the construction of asphalt pans and the installation of the machinery required for the spraying process. It is necessary here to emphasize again that the spraying process of salt manufacture is still in the experimental stage and it is as yet too early to determine the durability of the asphalt pans or the cost of their upkeep.

Works cost.

The costs given by Messrs. Grax Limited are for the year 1928. In that year the Company produced 253,550 maunds of salt, approximately 9,400 tons. Of this 170,900 maunds was common salt and 82,650 fine salt. Since for the manufacture of fine salt cement pans are employed, the capital cost of which is high, and since the manufacture of fine salt requires more care and attention and therefore higher labour charges, it is obvious that the cost of manufacture of fine salt will be considerably above the average cost of Messrs. Grax Limited in the year 1928. Further, we think it necessary to point out that the use of cement pans is still in the experimental stage. Opinion among salt manufacturers is by no means unanimous as to the feasibility of salt manufacture on an economic scale in cement pans and we have heard it stated not only that the capital cost of constructing such pans is prohibitive but also that the cost of upkeep is heavy. Subject

to the above qualifications we give the works costs of the various works in tabular form:—

TABLE No. 7.

	Aden.	Indo-Aden.	Okha.	Grax.
		(Annas per ton.)		
Works labour	20·61	21·50	48·00	41·32
Current repairs	2·87	3·00	—	5·17
Power and fuel	—	3·00	—	2·23
Crushing	15·58	18·50	12·50	20·40
Supervision and office	6·43	7·50	8·50	4·62
Taxes, royalty, etc.	16·91	15·75	10·83	—
Transport from works to ship	10·24	15·50	29·16	32·00
Total works cost f.o.b.	72·64	84·75	108·99	105·74

Overhead charges.

39. In order to determine the fair selling price overhead charges and profit have to be added to these works costs. In the case of the first three works no difficulty presents itself since their layout is complete or practically complete. But the works of Messrs. Grax Limited are still far from complete and at present could not produce more than between 10,000 and 15,000 tons annually. At our request the Company has furnished us with a statement of the capital cost required to equip their works for an output of 60,000 tons of salt annually. Excluding from their estimate Rs. 2,00,000 allowed for working capital and Rs. 1,22,000 for a tug and barges, the capital required would be about Rs. 17,00,000, and in estimating their profit and overhead charges we shall take their block account at Rs. 17 lakhs and their production at 60,000 tons.

Neither of the Aden firms has any managing agency charges. Management is included in supervision and office charges. For the Okha Salt Works the Bombay office charges including agency allowance and insurance on works are estimated at 8 annas 6 pies per ton on an output of 60,000 tons. For the year 1928 a charge of Rs. 7,596 was debited by Messrs. Grax Limited on account of Managing Agents' allowance and commission. We observe, however, that the auditors consider a reasonable figure would be Rs. 2,000 a month. On an outturn of 60,000 tons a total charge for head office of Rs. 30,000 or annas 8 per ton appears to us to be not unreasonable. We think that the same figure, namely 8 annas a ton, may be taken for both the Okha Salt Works and Grax Limited.

For the purpose of calculating the incidence of the overhead charges of the various works we have taken the following figures for output and block value:—

	Aden.	Indo-Aden.	Okha.	Grax.
Output in tons	125,000	75,000	60,000	60,000
Block value in lakhs of rupees	40	17	7	17

On ordinary earth embankments and pans, there is practically no depreciation, as repairs are carried out annually and charged to works costs. Some provision has to be made against more extensive damage from storms. On the whole we think 2½ per cent. is a reasonable allowance on buildings and permanent works and 10 per cent. on plant and machinery. This would give approximately an all round rate of 5 per cent., but in the case of the Okha Salt Works where the cost of machinery forms a more substantial portion of the total capital cost, a charge of 7½ per cent. would be more appropriate. Working capital is estimated at 4 months turnover (works cost and freight) and interest is calculated at 7½ per cent. Profit is calculated at 10 per cent. per annum on capital cost. The incidence of these charges will therefore be as under:—

	Aden.	Indo-Aden.	Okha.	Grax.
		(Annas per ton.)		
Depreciation . . .	25·60	18·13	14·00	22·66
Interest on working capital .	4·97	5·27	5·87	5·19
Profit	51·20	36·26	18·66	45·33

The reason for the large difference in depreciation between the Aden and Indo-Aden Works is partly that the former construct and maintain their own lighters for shipping their salt but mainly that the works of the former Company which has a much longer lease are constructed on a more permanent and substantial basis.

Fair selling price.

40. The total overhead charges and profit may now be stated as follows:—

	Aden.	Indo-Aden	Okha.	Grax.
		(Annas per ton.)		
Head office charges . .	—	—	8·00	8·00
Depreciation . . .	25·60	18·13	14·00	22·66
Interest on working capital .	4·97	5·27	5·87	5·19
Profit	51·20	36·26	18·66	45·33
TOTAL .	81·77	59·66	46·53	81·18

Adding to these figures the works costs (paragraph 38) we obtain fair selling prices f.o.b. as follows:—

	Aden.	Indo-Aden.	Okha.	Grax.
		(Annas per ton.)		
Works costs . . .	72·64	84·75	108·99	105·74
Overhead charges and profit .	81·77	59·66	46·53	81·18
TOTAL .	154·41	144·41	155·52	186·92

At present freight is approximately Rs. 7-8-0 per ton from Aden and Okha and Rs. 6 a ton from Karachi. To this has to be added about 6 annas per ton for insurance and loss in transit and

10 annas for brokerage in Calcutta. The fair selling price per ton c.i.f. Calcutta then becomes:—

Aden.	Indo-Aden.	Okha.	Grax.
		(Annas per ton.)	
290·41	280·41	291·52	298·92
		Per 100 maunds.	
Rs. 67	Rs. 64	Rs. 67	Rs. 69

Certain general conclusions may now be drawn from these figures. As we should expect, the lowest costs occur at the Indo-Aden works. Indo-Aden salt, though suitable for the Bengal market, is slightly inferior in colour to other Red Sea salts. The aim of the management is to produce a salt suitable for Indian consumption at the lowest possible price and Indo-Aden salt as a rule commands a price of one or two rupees lower than other Red Sea salts. At the same time, at this price it undoubtedly offers to the market a quality for which there is a steady demand. As has already been stated, subject to a certain minimum standard of quality, price appears to be the determining factor in the demand at any rate over long periods, and Indo-Aden salt may therefore be regarded as the standard solar salt which will eventually regulate the price which competing salts may expect to obtain. The cost of Aden salt is Rs. 3 per 100 maunds higher than that of Indo-Aden. This is largely due to the high depreciation and profit charges. The capital cost of the Aden works is much higher proportionately than that of the Indo-Aden since the works are much more substantially built. In consequence they are far less likely to be damaged by washaways and the cost of upkeep is less. We have not made any allowance for this difference in the rate of depreciation. If allowance were made the cost of production should not much exceed that of the Indo-Aden works. The cost of the Grax works is an average cost of common and superfine salt. The latter is manufactured with a view to competition with Liverpool salt, but the former when crushed should also be suitable for the Calcutta market. According to the Company's auditors the cost of producing common salt is some Rs. 3 per 100 maunds below the average cost. The cost of producing superfine salt is some Rs. 4 per 100 maunds more than the average cost given. The cost of common crushed salt and superfine salt would therefore be Rs. 66 and Rs. 73 per 100 maunds respectively. The figures given for the Okha works make no allowance for contingencies for which the Company claims about Rs. 4 per 100 maunds. This would bring the Okha figure to about Rs. 71 per 100 maunds.

Standard price of seaborne salt.

41. On a consideration of these figures we propose to attempt to determine the standard price for second grade crushed salt corresponding to the ordinary class of solar salt imported into India, that is to say, the price which the Bengal consumer might reasonably be expected to pay on an average over a long period. Since Indo-Aden salt has been able to face competition successfully for many years and since its price is as a rule somewhat lower than

that of other salts, it is unlikely that the consumer would on an average over a series of years obtain his seaborne salt cheaper from any other source of supply. We propose therefore to base our standard price on the cost of supplying Indo-Aden salt to the Calcutta market. We have found the fair selling price in 1928 was Rs. 64 per 100 maunds *ex* ship Calcutta. The various items which go to make up this price have varied somewhat from year to year. We think, however, an all-in cost *ex* works of Rs. 8 per ton is a fair price. The cost of shipping and loading at Aden is approximately Re. 1 per ton. Shipping freights have varied considerably. In 1928 the freights paid by the Indo-Aden Company were as low as Rs. 6-8. In 1929 they varied between Rs. 7-4 and Rs. 8-4, the average for the nine steamers employed being Rs. 7-10. On the other hand the representative of the British India Steam Navigation Company informs us that present freight rates are low and will probably be raised. On the whole, over a period of years Rs. 8 per ton is not unreasonable. To this have to be added insurance and wastage charges of 6 annas a ton and brokerage in Calcutta of 10 annas a ton. We thus obtain a standard price *ex* ship of Rs. 18 per ton = Rs. 66 per 100 maunds.

Effect on individual works.

42. If this price were fixed for a series of years all the Aden salt works should secure reasonable profits. The Grax works should be able at present when freights are low to secure a fair profit on all common crushed salt, if sold in the Bengal market, while the Okha Salt Works would only be able to sell by sacrificing a portion of their profit. As regards other works in Karachi, it may be pointed out that in one respect Karachi enjoys a decided advantage over Aden. The Luxmi, Moon and Star Works rely entirely upon subsoil brine. This brine has a very high initial density, being on the average 15° and in some pits as high as 18° Baume. Much of the expenditure on condensers, which have to be constructed at Aden on account of the comparatively low initial density of sea water, is unnecessary in these works. Overhead charges are therefore low. Further, the soil of the Luxmi and Moon works though perhaps not quite as suitable as that at Aden, is yet sufficiently hard and impervious to form a satisfactory bed for the crystallising pans. Artificial beds are therefore unnecessary. The exclusion from the Grax costs of the capital outlay on cement pans would result in a saving in overhead charges of about Rs. 4 per 100 maunds. Where, therefore, as in the case of the older works, subsoil brine is used and there has been no extra outlay on artificial crystallising beds, it is probable that at the present time crushed salt can be produced and sold *ex* ship Calcutta at about Rs. 63 per 100 maunds at a profit. For such works over a series of years, even allowing for variation in freights, a standard price of Rs. 66 would be satisfactory. It is necessary however to point out that this price is somewhat higher than the present cost of transport from Aden to Calcutta would justify and is sufficient to give the Okha and Grax works almost their full profit on present cost of production. The matter is of some importance

since should it be decided and should means be devised to guarantee this price to Indian (including Aden) manufacturers, it should not be subject to frequent revision merely on account of changes in costs, especially costs of transport. Manufacturers would be expected to build up adequate reserves in favourable years, when transport charges were low to provide against unforeseen variations in costs. It has been previously mentioned that Grax fine salt and perhaps to a less extent Okha salt is being manufactured with a view to competition with Liverpool salt. The latter sells at a premium of from Rs. 7 to Rs. 8 per 100 maunds above solar salt. We have been informed that on one occasion Grax superfine salt fetched as much as Rs. 78 at a time when the price of Liverpool salt was Rs. 81 per 100 maunds. If the price for second grade crushed salt were fixed at Rs. 66, the price for Liverpool salt would be Rs. 73 or Rs. 74. At this price both Okha and Grax Limited would earn satisfactory profits on such salt as they may be able to sell in competition with Liverpool salt. It is necessary to point out, however, that chemical analysis does not justify the claim that Grax superfine salt is equal to the Liverpool standard (*vide* paragraph 35). It appears to us doubtful whether Grax superfine could be sold for any length of time as other than second grade solar salt. In any case it should be realised that the demand for high class brine salt is limited, the total amount imported being only about 100,000 tons per annum. Any works, therefore, designed to meet this demand exclusively will have to face severe competition from alternative sources of supply. Finally, it should be noted that neither the spraying process of manufacture employed at Okha nor the use of cement beds at the Grax works has yet been proved commercially successful. The durability of cement and asphalt pans has yet to be tested and so far as the output of one of these works depends on artificial means of evaporation or crystallisation, the future of the industry is uncertain. We have found in Chapter II that Karachi and Okha could produce about 150,000 tons of white crushed salt annually. Of this a portion could be produced at a cost not exceeding that at Aden, but on the information at our disposal it is impossible to determine the amount since this will depend on the strength of the brine used and the suitability of the soil for the construction of impervious beds for the crystallising pans. As regards the remainder produced largely by the use of artificial beds and in the case of the Okha Salt Works by a special spraying process, it is as yet too early to arrive at any definite conclusion whether manufacture on these lines will prove a commercial success. Even if this estimate of output is considerably reduced, our conclusion that India could be made self-supporting in respect of its salt supply remains unchanged. For, assuming that Aden is considered a part of India for the purpose of this enquiry, any deficiency in the supply from these sources could be made good by increased production at Aden, while the considerable possibilities of production in the undeveloped area at Karachi have not been taken into account.

CHAPTER IV.

Cost of Railborne Salt.

43. By railborne salt in this and succeeding chapters is meant salt manufactured in the Northern India sources for which the normal method of transport to the Bengal market is by rail. In an earlier chapter we have found that rock salt mined in the Punjab Salt Range, and brine salt produced at Sambhar and Pachbadra would, when crushed, be suited to the requirements of the Bengal market. It is therefore necessary to consider the cost at which such salt can be produced. The most important source of production in the Punjab Salt Range is the Khewra mine. This mine is the property of Government. The following are the costs for the Khewra mine in 1928-29 as given by the Commissioner of Salt, Northern India Salt Revenue:—

Costs at Khewra: Works cost.

	Rs.	A.	P.
1. Works labour	3,37,574	13	9
2. Power and fuel	1,58,720	12	9
3. Ordinary current repairs and maintenance of buildings, plant and machinery	36,202	5	11
4. General services, supervision and local charges	2,25,504	0	9
5. Miscellaneous, *e.g.*, rent, municipal taxes, insurance, etc.	—51,923	14	4
6. Any other single item not enumerated above which amounts to 5 per cent. or more of the total expenditure—			
(*i*) Interest on capital outlay Rs. 1,27,100 14 1			
(*ii*) Depreciation 1,14,775 15 10			
(*iii*) Weighment charges 57,400 1 2			
	2,99,276	15	1
TOTAL	10,05,355	1	11

The total production was 3,056,478 maunds and the cost per maund therefore amounts to 5 annas 3 pies. We have been informed that with the same plant an increase in outturn of approximately 50 per cent. can be attained. If the balance which is not required for the existing market were crushed and placed on the Calcutta market there should be no difficulty in disposing of this output. With an increase in output, there will be a corresponding reduction in the cost. The incidence of works labour will remain unchanged, since the system of payment is by piece work. It is probable that there will be some slight reduction in the incidence

of the charge for power and fuel which may be estimated at 2 pies per maund. With the increased production it is improbable that there will be any considerable increase under the head "Ordinary current repairs and maintenance of buildings". There should be no increase in the charges under the following heads:—

Supervision and local office charges—	Rs.
(1) Pay of officers	38,647
(2) Pay of establishment	47,725
(3) Allowances	3,360
(4) Contingencies	10,113
(5) Supplies and services	50,244
	1,50,089
Miscellaneous—	
(1) Rent, rates and taxes	364
(2) Medical charges	9,423
(3) Pensionary charges	24,661
(4) Leave salary paid in England	6,532
	40,980

The total present expenditure under these three heads is Rs. 2,27,369 giving an incidence on an outturn of 30 lakhs of maunds of 1·21 annas. Allowing for some slight increase in expenditure under the head "Ordinary current repairs and maintenance of buildings" the probable expenditure under these three heads may be placd at Rs. 2,30,000. On an outturn of 45 lakhs of maunds the incidence will be ·8 anna, a reduction of ·41 anna or approximately 5 pies. As regards the share of Commissioner's headquarters office and audit and accounts, the present allocation to Khewra is Rs. 73,000, which on an output of 45 lakhs of maunds gives an incidence of 3·1 pies per maund. From a note supplied to us by the Central Board of Revenue we understand that the present allocation is based on a misconception and results in production being slightly overcharged. We consider therefore that 2½ pies per maund would be a reasonable charge under this head. The present allocation to the Khewra mine (Rs. 73,000) on the existing output of 30 lakhs maunds gives an incidence of 4·6 pies per maund. There will thus be a reduction of 2·1 pies. Weighment charges at present stand at Rs. 57,400 giving an incidence of 3·65 pies per maund. The Central Board of Revenue now informs us that only 1/6th of the cost of weighment will in future be debited to manufacture: on an output of 45 lakhs maunds this will give an incidence of ·40 pie or a reduction of 3·25 pies. From the statement of the General Manager, Salt Range, in evi-

dence it is clear that weighment charges include loading and despatch.

Overhead charges.

44. We now have to consider the overhead charges. The present block value of the works has been given to us as Rs. 24·30 lakhs. Of this the General Manager, Salt Range Division, states that Rs. 1·49 lakhs represents assets which are now valueless. Deducting this sum, we consider that three quarters of the balance represents a fair valuation of the present block account of the works, namely Rs. 17 lakhs. No allowance appears to have been made for a large obsolete tunnel. The block account also includes Rs. 3 lakhs spent on protection of the mine from subsidence. Half the work however was defective and had to be done over again. Further, about Rs. 6·66 lakhs was spent on plant and machinery before 1924, when prices were high. On the whole we consider that Rs. 17 lakhs may be accepted as the replacement value of the works although in our opinion it constitutes a somewhat generous allowance. For depreciation we allow 10 per cent. on machinery and 2½ per cent. on the remainder of the plant. This works out to an all round figure of 5 per cent. and on Rs. 17 lakhs would give an annual depreciation of Rs. 85,000. For interest on investment we allow 5½ per cent. corresponding approximately to the rate of Government borrowing. This gives an annual total of Rs. 93,500. On an output of 45 lakhs maunds interest and depreciation works out at 7·6 pies per maund. In view of the credit system of sale the interest on working capital will represent a somewhat higher figure than we should normally allow in the case of a private firm and we take a working capital of 9 months turnover at works costs or about Rs. 4 lakhs. Interest on this amount at 5½ per cent. would be Rs. 22,000. On an output of 45 lakhs of maunds the incidence would be 1 pie per maund. The total incidence of the overhead charges will be 8·6 pies per maund. The present charges under these heads are "Depreciation Rs. 1,14,775" and "Interest on capital outlay Rs. 1,27,100" giving an incidence of 15·5 pies per maund on an output of 30 lakhs maunds. There will therefore be a reduction under these heads of 6·9 pies per maund.

All-in cost of production.

45. According to our estimate then, on a production of 45 lakhs maunds, there will be a reduction in the cost per maund as follows:—

	Reduction in cost per maund. Pies.
Power and fuel	2
Current repairs, supervision, miscellaneous	5
Share Commissioner's office, Audit and accounts	2·1
Weighment	3·25
Overhead charges and profit	6·9
	19·25

or Re. 0-1-7¼

The present cost per maund has been given as 5 annas 3 pies. On a production of 45 lakhs maunds this will decrease to 3 annas 8 pies per maund, and adding 8 pies for crushing charges we obtain a cost for crushed salt of 4 annas 4 pies. We contemplate that eventually at least 60 lakhs maunds (200,000 tons) of salt will be produced annually at the Khewra mine. In framing an estimate of cost on an output of 45 lakhs maunds we have been influenced partly by a desire to give Government some indication of the level of costs which should be obtained in the immediate future and partly by the fact that, no addition to the existing plant being required, a considerable degree of accuracy can be claimed for our estimate. It is impossible to estimate with the same precision what the cost would be if an output of 60 lakhs were reached, but it is obvious that an appreciable reduction in the cost per maund would result. It is necessary here to point out that the mines are not fully mechanised at present and a very large amount of hand labour is utilized. Except for a central railway to take the salt to the pit's mouth and the use of compressed air for drilling nearly all the work is done by hand. At present as many as 40 galleries are being simultaneously worked. If the mine were fully fitted with mechanical appliances and transport and worked intensively in convenient sectors a substantial saving would be effected. The General Manager, Salt Range Division, considers that in this manner the cost of labour for excavation and transport which now amounts to about 1 anna 7 pies per maund might be reduced to about half. If we consider therefore the effect of a further increase in output from 45 to 60 lakhs maunds per annum, and also the economies which should be effected by the complete mechanization of the mine, it appears to us not unreasonable to suppose that with an output of 60 lakhs maunds per annum salt can be extracted at Khewra at approximately 2 annas 6 pies per maund f.o.r.

Analogy with coal mining.

46. We have attempted to check this estimate by a comparison with the costs of raising coal. *Primâ facie* it would appear that the cost of extracting salt at Khewra should be on a much lower scale. The mine is reached by an incline and no shafts have to be worked. In coal mines the seam must be followed and the cost of extraction depends to some extent on the thickness and direction of the seam. At Khewra the formation of rock salt is so extensive that conditions of extraction resemble those of quarrying and the costs should therefore be below those of the average coal mine. On examining the costs of one of the largest and best equipped collieries in India we find that the all-in cost of coal at the pit's mouth is approximately 3 annas a maund (Rs. 5-6 per ton). This colliery is lavishly equipped with machinery obtained at a price far in excess of that at present prevailing. On the basis of present prices of equipment their costs would be appreciably lower. Present prices of coal in the Bengal market vary between Rs. 6-4 and Rs. 3-4 at pit's mouth and we observe that several coal companies whose coal fetches from Rs. 4-8 to Rs. 5 per ton, equivalent to less than 3 annas a maund at pit's mouth, are showing a satisfac-

tory profit. On the analogy of the costs of extraction in coal mines and on a consideration of the probable reduction in costs which may be expected as a result of increasing the output to 60 lakhs of maunds per annum and of mechanizing the mine, it appears to us that 2 annas 6 pies f.o.r. is a reasonable estimate of the future cost of Khewra salt. To this must be added crushing charges at 8 pies per maund giving a total cost f.o.r. of 3 annas 2 pies per maund. At present Khewra salt for consumption in the Northern India markets is sold at 4 annas 6 pies per maund. Consumers of rock salt have however no reasonable claim to a reduction in price which has been caused merely by an extension of the demand in Bengal. The point is one to which we will recur later. Meanwhile, since there is nothing inconsistent with Government policy therein, we may assume that the price of crushed salt on an output of 200,000 tons would be the average cost of production of all salt at Khewra, *viz.*, 2 annas 10 pies.

Costs at Sambhar.

47. We turn now to consider the cost of producing salt at Sambhar. Here there is little, if any, scope for expansion. The normal capacity is estimated at about 70 lakhs maunds. In 1928-29 the output was 67 lakhs maunds and we may take the costs of that year as representing approximately the average cost of production. The total expenditure in that year was Rs. 21,87,375, which on a production of 67 lakhs maunds gives an incidence of 5·2 annas. The following items included in these costs require consideration:—

	Rs. (Lakhs.)
Royalties and compensation	9·737
Interest on capital	3·444
Depreciation	1·662
Weighment	1·096
Commissioner's office	·418
Accounts and audit	·228

Royalties.

48. The total fixed compensation payable annually to the various Indian States from which rights were purchased by the Government amounts to Rs. 27,46,346. Of this Rs. 16,49,704 is payable to Jodhpur and Jaipur. Under the present system of allocation the amount of fixed compensation debited to manufacture is Rs. 3 lakhs only; this sum is distributed between Sambhar, Didwana and Pachbadra in proportion to the sales at each source. In addition Government debits to the cost of manufacture at Sambhar a royalty which it pays to the Jodhpur and Jaipur Darbars of two-fifths of the selling price of all salt issued from the Sambhar works in excess of 17·25 lakhs of maunds per annum. The accounts of any one year are debited with the payments on issues in the previous year. Thus in

the Sambhar accounts of 1928-29 Rs. 9,73,714 have been debited for royalties as follows:—

	Rs.
Fixed compensation	2,62,825
Royalty	7,10,889
	9,73,714

The incidence in the year 1928-29 therefore works out at 2·3 annas per maund. Since the selling price during that year was 4 annas 3 pies per maund, the royalty works out at about 50 per cent. of the price. We have studied with some care the Treaties under which the amounts payable were fixed and also a very lucid note on the subject prepared for us by the Central Board of Revenue. While admitting that the present allocation is justified on a consideration of the wording of the Treaties, we cannot agree that it is equitable to include royalty on this scale in the cost price. Two aspects of the case appear to us to be of great importance. In the first place, the acquisition of these sources of salt supply was part of a general scheme for the abolition of the Customs line, which at that time stretched for some 2,470 miles from Torbela on the Indus to the river Mahanadi in the Central Provinces and was guarded at a cost of some Rs. 16¼ lakhs annually. Commercial considerations must have played but a small part in determining the compensation offered, the amount of which must have been affected largely by political considerations. In the second place, the amount of Sambhar salt which crossed the Customs line in the year 1870—this probably represents very nearly the whole production at the time—was only 5½ lakhs of maunds. It could never have been foreseen that the present output would be attained and the provision of a limit of 17·25 lakhs maunds within which no fluctuating royalty was payable must have represented the maximum production which at that time was considered probable. In these circumstances it is intelligible that so high a fluctuating royalty as 40 per cent. of the selling price should have been agreed to. We have examined the conditions of leases that have come under our notice at Aden, Karachi, Okha and other parts of British India. In Aden, the royalty claimed by the Government is 8 annas per ton. In Karachi and other parts of British India no royalty is payable. In Okha the Baroda Government charges a royalty of 10 annas a ton. It appears to us not unreasonable to expect that a royalty of not more than 8 to 10 annas a ton, or say 4 pies a maund, should be included in the costs. Thus the area served by Sambhar salt will be placed on practically the same footing as other parts of India in respect of royalty. The balance of the royalty payable should be charged to general revenues.

Depreciation.

49. Turning now to overhead charges, the amount of depreciation debited in the Government accounts is Rs. 1·662 lakhs. The total block value has been taken at Rs. 54 lakhs. In accordance with our usual proce-

dure we now have to determine whether this may be taken as the present replacement value. Of the total capital account Rs. 36 lakhs was spent between 1920 and 1924 on the Sambhar Improvement Scheme. Prices of machinery and plant were at this period very much higher than at present. In our previous enquiries we have found that the replacement value of factories constructed during this period was approximately 40 per cent. below the block value. There is evidence that work under the Improvement Scheme was carried out under conditions which must have led to increased expenditure and it has been stated in evidence that the works if now constructed would cost about 20 per cent. less. It appears to us therefore not unreasonable to write down the portion of the capital expenditure incurred between 1920 and 1924, *viz.*, Rs. 36 lakhs, by 40 per cent. thus reducing the total block to Rs. 40 lakhs. In Government accounts the rates of depreciation charged are said to be $7\frac{1}{2}$ per cent. on plant and machinery and $2\frac{1}{2}$ per cent. on buildings and other construction including kyars. The rates charged are on the diminishing values. We propose to allow 10 per cent. on plant and machinery and $2\frac{1}{2}$ per cent. on other assets. Since the expenditure on plant and machinery constitutes about $\frac{1}{6}$th of the total expenditure, this would work out at about $3\frac{1}{2}$ per cent. On Rs. 40 lakhs the total depreciation will thus amount to Rs. 1·4 lakhs which on an average output of about 70 lakhs maunds would give an incidence of nearly 3·8 pies per maund.

Other overhead charges.

50. In view of the credit system of sale the interest on working capital will represent a somewhat higher figure than we should normally allow in the case of a private firm and we take a working capital of nine months' turnover at works cost, or about Rs. $4\frac{1}{2}$ lakhs. Interest on this amount at $5\frac{1}{2}$ per cent. would be Rs. 25,000. On an output of 70 lakhs of maunds the incidence would be ·7 pie per maund.

On the block account of Rs. 40 lakhs interest at $5\frac{1}{2}$ per cent. would amount to Rs. 2·2 lakhs which on an average output of 70 lakhs would give an incidence of 6 pies per maund.

Weighment charges amounted to Rs. 1·096 lakhs in 1928-29 and include also despatch charges. It has recently been decided that one-sixth only of weighment charges should be debited to manufacture. The amount therefore debitable to the cost will be Rs. ·183 lakhs which on an output of 70 lakhs maunds gives an incidence of ·5 pie per maund.

The present allocation to Sambhar on account of the share of Commissioner's headquarters office and audit and accounts is Rs. 64,788. On an output of 67 lakhs of maunds the incidence amounts to 1·8 pies per maund. As we have already stated, in dealing with this item of the Khewra costs the present allocation is based on a misconception and results in a slight overcharge. We consider that on the normal output a charge under this head of 1·5 pies per maund will be reasonable.

Fair selling price of Sambhar salt.

51. We compare the costs for 1928-29 with our estimate of costs in the statement below:—

	As. P.		As. P.
Works cost	1 3·4		1 3·4
Royalty and compensation	2 3·8		0 4·0
Interest on capital	0 9·8		0 6·0
Interest on working capital			0 0·7
Depreciation	0 4·6		0 3·8
Weighment	0 3·1		0 0·5
Share of Commissioner's office and Accounts and Audit	0 1·8		0 1·5
	5 2·5		2 7·9
Crushing charges	...		0 8·0
TOTAL	5 2·5		3 3·9

We estimate then that the cost of fine white crushed salt f.o.r. Sambhar should not exceed 3 annas 4 pies, or allowing about 3 per cent. for wastage 3 annas 5 pies per maund.

Pachbadra.

52. In the case of Pachbadra salt works we estimate a future production of 20 lakhs maunds against the output in 1928-29 of about 5 lakhs. It is quite impossible to assess the effect of this increase in production on the costs. We have no information as to the extent to which capital charges particularly for transport, sidings and possibly also storage may be increased. Reductions should occur in the incidence under the heads " General services ", " Miscellaneous ", " Current Repairs ", while it is probable that there would also be a reduction in the incidence under the head " Depreciation and interest ". The extent of such reductions cannot be forecasted. But we believe it to be safe to assume that with this increase in output Pachbadra salt could be utilised to replace Sambhar salt in the market without any increase and possibly with some reduction in current prices.

Possible criticisms anticipated.

53. In our discussion of costs we have based our estimate of depreciation and interest charges on the present replacement value of the plant. In regard to the Sambhar works we have proposed the elimination from the costs of far the greater portion of the royalty on the ground that it is much in excess of the royalty paid elsewhere. It may be urged however that the conditions postulated by us are entirely different from the conditions which have to be faced in the present enquiry. Applications heretofore have been received from firms or individuals working under competitive conditions. Conceding that protection was justified, the price which they could reasonably expect to receive would be limited by internal competition. Thus in determining the fair charges for depreciation and interest, it was reasonable to base these on the re-

placement value of the works, since the possibility of rival works being constructed could not be eliminated. In the case of the Northern India salt works conditions are entirely different. Competition from outside sources is limited by railway freight and in consequence to a very large extent these sources hold a monopoly of supply. So far as Sambhar salt is concerned, were manufacture not under Government control competition might be anticipated from imported salt, Kharaghoda salt and Khewra salt. But the rail freight from any of these sources would raise the cost of salt in the area now supplied from Sambhar much above the existing level. Government has for many years past laid down as its policy that salt shall be sold at cost price. Had the Rajputana sources of supply not been acquired by Government it may be presumed that the ordinary commercial policy of sale at the best price available having regard to competition from other sources would have been pursued. In that event the price at which Sambhar salt would have been available would have been at approximately the level at which Khewra, Kharaghoda or foreign salt could be supplied in these areas. It may also be claimed, therefore, that notwithstanding the fact that the royalty paid to the Jodhpur and Jaipur Darbars is at a very much higher level than the royalty charged to salt works elsewhere Government, by the acquisition of these sources of supply, has been able to reduce the price of salt in the United Provinces and parts of Bihar much below the price which would otherwise have prevailed. It might therefore be claimed that the royalty is a fair charge on the consumers of Sambhar salt while the recovery by Government of depreciation and interest charges based on the actual capital expenditure might not be considered unreasonable. If this aspect of the case were considered correct, it would mean that the price of crushed salt at Khewra and Sambhar would require to be raised from our estimates of 2 annas 10 pies and 3 annas 5 pies to 2 annas 10·3 pies and 5 annas 5·6 pies respectively, depreciation being calculated on the block account less depreciation already set aside.

54. While we have indicated to what extent our proposals may be open to criticism, we consider our suggestion, that in fixing the price level of Sambhar salt royalty should be reduced to 4 pies per ton and that depreciation and interest charges should be fixed on the replacement value of the plant, is fully justified both on theoretical and practical considerations. It is by no means certain that if control of the Rajputana sources of supply had not been acquired by Government competitive conditions would have been eliminated. It is impossible at this date to suggest how the manufacture of salt would have developed in Rajputana had the sources of supply not been acquired by the Indian Government. Jodhpur and Jaipur were at that time not the only States in which salt was manufactured, while manufacture by numerous individuals under licence (as in Madras) would probably have insured competitive conditions. It is therefore by no means certain that the consumer in British India is now obtaining his salt at a cheaper price than if control had not been

Proposals justified.

assumed and it is equally open to doubt whether the Jodhpur or Jaipur Darbars would have been able to obtain a royalty higher than that charged elsewhere as for example in Baroda, where the royalty is 10 annas per ton. In these circumstances it appears to us that a fair charge to the consumer on account of royalty is 4 pies per maund and that anything in excess of this should be a charge on general revenues. The proposal has definite practical advantages also. According to our proposals the issue price will be about 3 annas 5 pies and at that price the consumer of Sambhar salt will gain to the extent of about Rs. 7 lakhs a year. It is true that the greater part of this gain is at the expense of general revenues but the reduction of the issue price from 5 annas to 3 annas 5 pies would result in a reduction of the fluctuating royalty of Rs. 2 lakhs and this would be clear gain to the country while, as we shall explain later, the additional charges against general revenues may to some extent be met by increased earnings from State Railways.

Sambhar salt should be screened.

55. When we visited the Sambhar salt works we were informed that the price obtainable for Sambhar salt depended largely on the size of the crystals. Large grained salt obtained a better price than the uniform issue price charged by Government would justify, while small grained salt was frequently unsaleable. It was generally agreed that if Government screened their salt so as to ensure a comparative uniformity in size, dealers would readily pay one anna a maund more. This increase would not be passed on to the consumer, who already is paying at a higher rate than that justified by the Government price on account of the proportion of unsaleable small salt at present issued. It appears to us that Government might well undertake to screen their salt at Sambhar. If about 25 per cent. representing the small salt were utilized for crushing and the balance of larger grained salt were sold at a slightly enhanced price, say $5\frac{3}{4}$ annas a maund on the average output of 70 lakhs maunds, the additional profit thereby obtained on $52\frac{1}{2}$ lakhs of maunds would represent a little over 2 annas a maund on $17\frac{1}{2}$ lakhs of small salt utilized for crushing.

CHAPTER V.

Comparison of Railborne and Seaborne Salt.

56. Of the total cost incurred in supplying salt to the Bengal market expenditure on transport forms by far the larger portion. For salt supplied from the Northern India sources the cost of transport is represented mainly by railway freight, but for seaborne salt the heads under which this charge falls are transport—

Transport of seaborne salt: *ex* ship Calcutta.

(*a*) from works to ship,

(*b*) from port of export to that of import,

(*c*) from ship to gola or warehouse, and

(*d*) from gola to railway station.

Before any conclusion can be reached as to whether the interests of the consumer are best served by the supply of railborne or seaborne salt, it is necessary to compare the prices at which salt from the different sources of supply can be delivered in the market. Since Calcutta forms the main distributing centre, the comparison should be drawn between the respective prices f.o.r. Calcutta. The cost of producing crushed salt has already been fully discussed in Chapters III and IV. In the earlier of these chapters we have taken Rs. 8 per ton as the fair selling price of seaborne salt *ex* works; the cost of transport from works to ship has been taken as Re. 1 per ton; and freight, including six annas for wastage and insurance, as Rs. 8-6. To the foregoing must be added importers' brokerage at 10 annas a ton, giving an *ex* ship price of Rs. 18 per ton.

Ex ship to gola.

57. The following items constitute the cost of removal from ship to gola per 1,000 maunds:—

	Rs.	A.
Boat hire	35	0
Weighing	2	0
Unloading and storing	26	0
Port Trust overside charges at Rs. 1-4 per ton	46	4
Miscellaneous	2	8
Night charges	2	8
TOTAL	114	4 or Rs. 3 2 per ton.

An extra charge of Rs. 22 per 1,000 maunds is payable when unloading and storing are done between the hours of 6 and 10 P.M. No exact proportion can be given of the salt removed at night. Messrs. Bird and Company, who hold the contract for unloading and storing, estimate the amount at 10 per cent. of the salt stored in golas. We have therefore allowed Rs. 2-8 per 1,000 maunds as the approximate figure.

58. The charge for loading from gola into wagon is Rs. 18-4 per 1,000 maunds=7 annas 10 pies per ton. Gola rent amounts to Rs. 4 per month per 1,000 maunds, but the rent is chargeable on the capacity of the gola and therefore the incidence per ton may be higher than these figures suggest. Further, we do not know the average period during which salt remains in the golas. The total rent recovered by Government in a year is about Rs. 1½ lakhs. The total annual import of salt is about 500,000 tons (13,500,000 maunds). Of this about half (6,750,000 maunds) passes through the golas. The incidence of the rent therefore is about 4·25 pies per manud or 9 annas 8 pies a ton. Interest charges will be incurred on stocks and must vary according to the rate of delivery. Assuming clearance in six months, interest might amount to 11 annas a ton. Weighment charges have also to be added: these amount to Rs. 3 per 1,000 maunds. Wastage may be put at Re. 1 per 100 maunds. Together these charges give an incidence of 5 annas 7 pies per ton. The charges incidental to railing *ex* gola are thus—

From gola to wagon.

	Per ton. Rs. A. P.
Loading	0 7 10
Rent	0 9 8
Interest	0 11 0
Wastage and weighment charges	0 5 7
	2 2 1

The price at which a wholesale merchant may normally expect to obtain seaborne salt (crushed second quality) may now be stated as follows:—

	Per ton. Rs. A. P.
Ex works	8 0 0
F.o.b.	9 0 0
Ex ship	18 0 0
Delivered in gola	21 2 0
F.o.r.	23 4 1

This corresponds to a price of 13 annas 9 pies per maund or Rs. 86 per 100 maunds f.o.r. Calcutta, the cost of transport amounting to Rs. 56 per 100 maunds or 9 annas per maund. A portion of the salt landed at Calcutta does not enter the golas but is taken direct to the railway stations. Interest, gola rent and some incidental charges are thereby saved, but we have been informed that the difference in the f.o.r. price is negligible. In respect of the salt supplied to the water districts of Eastern Bengal it is difficult to make any general comparison. The bulk of this salt is probably transhipped direct to the flats or country craft by which it is carried to its destination and there will undoubtedly be a considerable saving in the transport and handling charges payable after delivery is taken *ex* ship as compared with the salt which passes through the golas.

59. It is now necessary to estimate the price at which railborne salt can be delivered f.o.r. Calcutta. It is obvious that if present rates remain unchanged, it would be impossible for Khewra or Sambhar salt to compete with imported salt in the proximity of Calcutta as will appear from the following table:—

Transport of railborne salt.

TABLE No. 8.

	Railborne salt				Price of seaborne salt f.o.r. Calcutta.	
	Board's estimate of price per 100 maunds *ex* works.	Railway freight per 100 maunds.	Price f.o.r Calcutta		Per 100 maunds.	Per maund.
			Per 100 maunds.	Per maund.		
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Khewra . . .	17 11 0	113 8 0	131 3 0	1 5 0	86	0 13 9
Sambhar . .	21 5 0	134 14 0	156 3 0	1 9 0	86	0 13 9

It would appear however that the question of reducing the railway freight on salt has never been seriously considered by the railway authorities from the point of view of attracting fresh traffic. Since up to the present there has been no demand in Bengal for Khewra or Sambhar salt, the consideration of the question was obviously premature. If, however, our suggestions for the development of the sources of salt supply in Northern India are accepted, the question of assisting the salt traffic to Bengal will become a matter of interest to the railway authorities We considered it desirable therefore to examine representatives of the principal railways concerned in order to ascertain to what extent a reduction of railway freights to a level which would admit of the import of Northern India Salt into the Bengal market was a practical proposition. Clearly the formulation of detailed proposals regarding the future level of freights is a matter which must be left to the railway authorities. In an enquiry of this nature we can do no more than indicate very generally the directions in which a reduction of freight while materially assisting the salt industry, would not be inconsistent with the interests of the railways themselves. In order to appreciate the subject from the railway point of view, it is important to explain the direction in which salt traffic moves at present and so far as possible to estimate the amount moving in each direction. Except about 60,000 tons which are shipped direct to Chittagong, all imported salt, *viz.*, about 440,000 tons, is distributed through Calcutta though a portion is distributed by river and not by rail. Most of the traffic moving west of Calcutta is conveyed by the East Indian Railway, the balance moving along the Bengal Nagpur Railway. According to an estimate supplied

by the East Indian Railway, about 235,000 tons annually is transported by them. Of this about 45,000 tons go by Naihati to the northern markets on the Eastern Bengal Railway. About 47,000 tons is transported by the Bengal Nagpur Railway mostly to the west. The eastern markets are supplied mainly by river. As we have previously stated we have no definite figures of the quantities conveyed by river. Unless a new source of supply is established on the East Coast, all railborne salt for the Bengal market would travel from the Punjab or Rajputana southward and eastward towards Calcutta or along the north of Bihar and Bengal. Movements in this direction affect the principal railways in different ways. The East Indian Railway already has a considerable traffic in Khewra and Sambhar salt in the United Provinces and western parts of Bihar. It also carries the bulk of the imported salt from Calcutta westwards. The traffic from Khewra it shares with the North Western Railway and that from Sambhar with the Bombay, Baroda and Central India Railway.

Rates quoted by railways.

60. It is clear from the above statement of the position that the East Indian Railway is likely to be most affected by the substitution of railborne for seaborne salt. In order therefore to ascertain generally the views of the railway authorities on the question we examined in some detail the Deputy Chief Commercial Manager, Rates and Development, of the East Indian Railway. As we understand the position, the problem which we are considering resolves itself into a question of comparative rates between rail and sea freight. Since the traffic in uncrushed salt which the railways at present convey is unlikely to be seriously affected by competition from imported salt and since a reduction in railway freights is unlikely to result in any considerable expansion of that traffic, there appears no reason why, generally speaking, rates for uncrushed salt from the Punjab or Rajputana sources should be reduced. The position as regards crushed salt is entirely different. As we have shown in paragraph 58 the total cost of transport of salt by sea amounts to 9 annas per maund. In order to secure for the railways traffic which at present is conveyed by sea, it would be quite in accordance with the ordinary principles of rate adjustment to quote a railway freight slightly lower than the sea freight, subject to the condition that the total receipts thereby secured were in excess of the earnings already received from the carriage of imported salt. On this principle it appears probable that the railway authorities of the East Indian Railway in conjunction with the North Western Railway would agree to quote a minimum rate of ·1 pie per maund mile from Khewra to Calcutta or 11 annas per maund, the distance being 1,318 miles. For intermediate stations they would be prepared to quote station to station rates approximately equivalent to the average sea freight (this was taken at 8 annas a maund) *plus* the present rail freight from Calcutta to any station west of Calcutta. Such station to station rates would be subject to the condition that they should not be less than a rate calculated on the minimum rate of ·1 pie per maund mile.

We examined also representatives of the Bengal Nagpur and Bombay, Baroda and Central India Railways, and their views may be summarized as follows:—

(1) The Bombay, Baroda and Central India Railway is willing to quote in conjunction with the East Indian Railway (if the latter agrees) the minimum rate of ·1 pie per maund mile from Sambhar. The distance is 977 miles and the freight to Calcutta would therefore amount to about 8 annas a maund.

(2) As regards Pachbadra, assuming that the present concession freight of 9 pies from Pachbadra to Sambhar is maintained by the Jodhpur Railway, the freight to Calcutta would stand at 8 annas 9 pies.

(3) As regards stations between Sambhar and Calcutta and west of Calcutta, the Bombay, Baroda and Central India Railway is willing to quote, if the East Indian Railway agrees, station to station rates which would ensure the capture of new traffic.

A rate of 5 annas a maund is already in force on the Bengal Nagpur Railway between Naupada and Calcutta. The Bengal Nagpur Railway is prepared to quote the same rate from any station on the East Coast nearer Calcutta at which a salt factory may be established for the manufacture of white crushed salt for the Bengal market.

Favourable position of railborne salt.

61. Below we compare the resulting prices of railborne salt f.o.r. Calcutta with that of seaborne salt.

	Ex works.	Railway freight.	Total f.o.r. Calcutta.
		(Per maund.)	
	As. Ps.	As.	As. Ps.
Seaborne salt . . .	—	—	13 9
Khewra salt . . .	2 10	11	13 10
Sambhar	3 5	8	11 5

It will be seen therefore that Sambhar salt can compete with seaborne salt both in Calcutta itself and in all markets west, east and north of Calcutta save perhaps those at present served from Chittagong or by riverborne salt. Assuming that the present issue price of Pachbadra salt (4 annas per maund) cannot be reduced, and adding 8 pies for crushing charges and 8 annas 9 pies for railway freight, the total cost f.o.r. Calcutta would amount to As. 13-5 enabling it to compete if not in Calcutta itself at any rate in its vicinity. Khewra salt, it is true, could not compete with imported second class (solar) salt in Calcutta. On the other hand, crushed Khewra salt compares favourably with brine salt such as Liverpool and Hamburg salt, both in colour and in sodium chloride content. Since brine salt commands a premium of about Rs. 7-8 per 100 maunds or As. 1-2 per maund, it would appear probable that Khewra salt also could be placed on the Calcutta market.

For stations west of Calcutta railborne salt will have a decided advantage. As the distance from Khewra to destination decreases, the freight for Khewra salt falls while that for imported salt rises. The position is illustrated in the following table:—

TABLE No. 9.

Name of place.	Distance from Calcutta.	Freight from Calcutta.	Price of seaborne salt f.o.r. Calcutta.	Price of seaborne salt f.o.r. destination	Distance from Khewra.	Proposed freight from Khewra.	Price f.o.r. Khewra.	Price of Khewra salt f.o.r. destination	Difference of columns 5—9.
1	2	3	4	5	6	7	8	9	10
	Miles.	As. P.	As. P.	Rs. A. P.	Miles.	As. P.	As. P.	Rs. A. P.	As. P.
Memari . .	51	1 7	13 9	0 15 4	1,268	10 7	2 10	0 13 5	1 11
Burdwan .	67	2 1	13 9	0 15 10	1,252	10 5	2 10	0 13 3	2 7
Bolpur . .	99	3 0	13 9	1 0 9	1,266	11 0	2 10	0 13 10	2 11
Dhanbad . .	169	4 5	13 9	1 2 2	1,150	12 5	2 10	0 15 3	2 11
Madhupur .	183	4 8	13 9	1 2 5	1,186	12 8	2 10	0 15 6	2 11
Mokameh .	283	4 10	13 9	1 2 7	1,087	1. 10	2 10	0 15 8	2 11
Tilaiyah . .	312	7 8	13 9	1 5 5	1,052	15 8	2 10	1 2 6	2 11
Patna . .	332	4 10	13 9	1 2 7	1,038	12 10	2 10	0 15 8	2 11
Behea . .	382	6 0	13 9	1 3 9	988	14 0	2 10	1 0 10	2 11
Bhabua Road .	386	8 5	13 9	1 6 2	933	14 10	2 10	1 1 8	4 6

It is clear therefore that on the rates suggested salt from Northern India could compete in the greater portion of the Bengal market. The Deputy Chief Commercial Manager, Rates and Development, of the East Indian Railway estimates that on the assumption that 100,000 tons of imported salt is displaced by Khewra salt, the increased earnings of the East Indian Railway and North Western Railway after allowing for the reduction of traffic in imported salt would amount to about Rs. 10 lakhs. He points out also that the rates quoted are lower than are necessary to enable railborne salt to compete in the market. In this connection however it must be pointed out that in our estimate of the standard price of seaborne salt we have taken Rs. 8 as the average freight. At any one time however the freight may be considerably below this figure. It follows therefore that unless the railway authorities allow a considerable margin in their rates, the additional salt traffic which it is sought to obtain will be liable to heavy fluctuations corresponding to variations in the sea freight. Any increase in the railway freights over those now suggested appears therefore inadvisable.

CHAPTER VI.

Case for assisting the Salt industry and possible methods.

62. We turn now to a consideration of the extent to which the national interests will be served by assisting the manufacture in India of salt suitable for the Bengal market. The following are the points which require consideration in this connection:—

The national interests.

(1) the possibility of affording increased employment for Indian labour,

(2) the possibility of retaining profits in the country and

(3) the possibility of insuring against a shortage of fine white salt in war time.

63. Before considering these points it is desirable to determine the position which must be assigned to Aden in relation to the salt supply of India. There appear to be no strong grounds for differentiating between Aden and Okha or Karachi manufacturers. The Aden Administration on the civil side is subordinate to the Government of Bombay and in a sense therefore can claim to be a part of British India. Of the four companies operating in Aden three are owned by Indians. The non-Indian labour employed in superior posts at Aden is inconsiderable. Aden manufacturers are liable to Indian income-tax and pay ground rent and royalty to the Government of Bombay. Transport whether from Aden, Karachi or Okha is at present almost entirely in non-Indian hands, while all three sources of supply are equally liable in war time to have their communications interrupted or to suffer from a shortage of shipping. From the national point of view therefore there appears little to be gained by substituting Karachi or Okha salt for Aden salt. It is already the settled policy of Government to allow salt produced in Indian States and transported to Bengal or Burma by sea admission to the markets in those areas. It follows therefore that there is no case for treating the salt industry at Aden or at Okha differently from that at Karachi.

The position of Aden.

I.—Seaborne salt.

64. It will be convenient to consider the question of national interest in relation to salt according as it is transported by sea or rail. In the former class will fall Aden, Karachi and Okha salt and in the latter Khewra and Rajputana salt. The Indo-Aden Salt Works employ about 600 men in the manufacture of 70,000 tons of salt. To produce 500,000

National advantage from encouragement of seaborne salt not great.

tons of salt not more than 4,000 men would be required, engaged mainly in manual labour. Machinery is used in salt manufacture on a small scale and there is little scope for the higher type of employment. The additional employment afforded by the establishment of the industry is therefore extremely limited. As regards profits, the capital expenditure of the Indo-Aden Works has been stated to be Rs. 17 lakhs for an output of 70,000 tons. The capital required for an output of 500,000 tons would not exceed Rs. 120 lakhs and allowing a profit of 10 per cent. the amount remaining in the hands of manufacturers would be approximately Rs. 12 lakhs. Taking the price of fine white crushed salt at Rs. 8 per ton *ex*-works the total amount of money retained in the country by the substitution of Indian for foreign salt would amount to about Rs. 40 lakhs. The whole of this advantage, however, will not accrue by the substitution of seaborne salt from India proper for foreign salt, if it is decided that there can be no discrimination between Aden and other Indian seaborne salt. For it must be assumed that Aden will retain at least her present import of 180,000 tons. If the balance 320,000 tons were supplied by Karachi and Okha it would mean employment of less than 3,000 additional men, while the additional amount of money retained in the country in the form of wages and profits would be about Rs. 26 lakhs. Thus, although the national interests are to some extent served by the encouragement of the production of salt at Karachi and Okha, the advantages are not so marked as to justify the country in undertaking any drastic action or imposing any considerable burden on the consumer. This is particularly the case inasmuch as the production of salt at Okha or Karachi would afford no guarantee against a shortage of white salt in Bengal such as occurred during the war. The normal method of transport from Karachi and Okha is by sea: their line of communication with Bengal is as vulnerable as that of Aden and all three ports alike would be equally affected by any shortage of shipping. It is true that it would be possible to transport salt by rail from Karachi or Okha to Bengal. But even if wagons were available, the length of the lead would largely increase the price of the salt. Facilities for loading on rail would also be required at Karachi in the form of a branch line and siding, which in normal times would not be used, sea transport being cheaper.

No case for protection on ordinary economic grounds.

65. From the economic point of view there is no case for protection in the proper sense of the term so far as Indian seaborne salt is concerned. The salt works at Aden have for many years faced foreign competition unaided and since we have found that these works form part of the Indian industry, no claim for protection of the industry as a whole can be substantiated. Further even if the works at Aden are excluded from consideration and salt manufacture at Karachi and Okha is regarded as a nascent industry, assistance on strictly economic grounds cannot be justified. These works on the whole possess no advantage over works situated on the Red Sea Coast in respect

of natural facilities for the production of salt including freight and in consequence no economies may ultimately be expected in the cost of salt to the consumer in Bengal such as would justify a case for protection on ordinary economic grounds. Moreover it has not been proved to our satisfaction that they could ever face competition unaided save in respect of a small proportion of the possible output. Consequently the position contemplated by the Fiscal Commission in which internal competition will eventually so reduce the price below the level of imported salt as to compensate the consumer for the sacrifices incurred during the period of protection is not likely to be established.

Present conditions exceptional.

66. In the circumstances it may appear superfluous to consider whether any of the recognized methods of protection are applicable in this case. At the present moment however, a condition of overproduction exists throughout the world in the salt trade. This is particularly the case in respect of Red Sea salt. New works are being established at Ras Hafun and Asab and late in 1929 a new company was floated to manufacture salt near Port Sudan for supply to the Indian market. Red Sea salt factories depend almost entirely on India for their market and a period of intense competition has now commenced, aggravated by the disappearance of the Salt Association in Bengal which as we have seen was for a period partially successful in eliminating competition and maintaining prices. In recent months prices have dropped to a very low level, and at the end of March last Port Said salt stood at Rs. 53 per 100 maunds *ex*-ship. Such prices cannot be regarded as economic and can only be justified on the assumption that losses will be recouped at a later date when competition has been eliminated. It might therefore be considered that in the national interest anti-dumping measures would for a time be justified. Further, definite proposals for protection have been put forward both by the Okha and the Karachi manufacturers and it is due to them that their suggestions should receive consideration and should be fully discussed.

Protective duty would be ineffective.

67. It must be borne in mind in considering the possibility of adopting any of the recognized methods of protection that it is our opinion that it would not be in the national interest to encourage the manufacture of salt in India when that salt must normally be conveyed to Calcutta by sea if thereby any considerable burden is imposed on the consumer. This finding in itself rules out the possibility of a protective duty. The Okha Salt Works Limited has suggested a protective duty of 3 annas a maund. The present price of Port Said salt is Rs. 53 per 100 maunds. We have found that over a long period the consumer in Bengal may reasonably expect to obtain his salt at Rs. 66 per 100 maunds *ex*-ship. On these figures a protective duty of Rs. 13 per 100 maunds or 2 annas a maund would be justified. The proposal clearly presupposes some measure of stability in the price of imported salt. But as we have shown in Chapter I price varia-

tions are so frequent and violent that the amount of protection is likely at one time to be excessive and at another time inadequate. In Appendix No. III we give the prices for the years 1925-29 from which it will be seen that the price of Liverpool salt has varied between Rs. 58 and Rs. 122 and that of Aden between Rs. 52 and Rs. 116 per 100 maunds. Even within the last 2½ years when the Salt Association attempted to stabilize prices the variations, though less frequent, were extensive as table No. 6 in paragraph 13 indicates.

It is idle for us to attempt to put any limit to the extent to which prices may decline, especially if a situation arises in which rival producers are determined to retain their market at any price. Much must depend on their resources as well as the natural advantages for production which they enjoy. There is evidence to show that the salt works at Port Said and the salt works on the Red Sea either already established or in process of development, depend largely, if not wholly, for their existence on a substantial share of the Indian market. The Port Said Salt Works alone are said to have a maximum capacity of 250,000 tons. The works at Massowah already import into Bengal over 50,000 tons annually and the new works at Ras Hafun and Asab on the coast of Italian Somaliland are stated to be designed for a joint production of 100,000 tons. There is no doubt that the older works have substantial reserves at their disposal to carry on an intensive and prolonged struggle. It was admitted by the representative of the Port Said Salt Works that the plant had been written down to such an extent that no depreciation was charged to costs. But in order to damage the industry at Okha or Karachi it would appear that competition need not be prolonged or continuous. An occasional consignment of one or two cargoes timed to arrive in Calcutta about the same time as Indian seaborne salt or the reduction for a time of the *ex*-gola prices would suffice. The Indian industry having no reserves would quickly succumb.

Off-setting duty.

68. In the face of such intensive competition and in the case of an industry in which even under normal conditions no stability of import prices can be assumed, it would appear that some provision for off-setting duties is essential. It is doubtful, however, whether any such scheme would be effective. Prompt action would be required and it appears unlikely that such machinery as the Government of India might accept for the imposition of off-setting duties would admit of the immediate relief which the Indian industry would require. Further very frequent changes in the off-setting duties would be necessary. This in itself would give rise to speculation and it is not improbable that the actual additional cost to the consumer would be considerably in excess of the duty imposed. Past experience has shown that whenever Government has contemplated an increase in the salt duties the market has been unsettled for considerable periods and the normal flow of supply and demand has been impeded. The effect on the market would be the same even when the additional duty is imposed, as in the

case of off-setting duties, for the purpose of counteracting a decline in import prices. Nor can we overlook the fact that political considerations must play a great part in the decision of any proposal for the imposition of off-setting duties on a commodity like salt. From a practical point of view we cannot avoid the conclusion that the position of the industry would be far from secure if it were to depend on the imposition of off-setting duties. Although at the present moment any considerable rise in the price of salt appears improbable, sudden rises have occurred in the past on account of unforeseen circumstances. The last large increase in price was caused by the coal strike in England in 1926, when the price of salt gradually rose to Rs. 122 per 100 maunds. In considering the practicability of imposing a protective duty we cannot ignore such considerations. Should the price of imported Red Sea salt rise to Rs. 66 (excluding any protective duty), protection would be unnecessary and any duty imposed would be an unwarranted burden on the consumer. It is true that in these circumstances the protective duty might be removed, but in view of the rapid fluctuations in the salt market such a course would be hazardous.

Burden on Bengal consumer unjustifiable.

69. On economic grounds also the case for the imposition of a protective duty cannot be sustained. The present import of Indian white salt by sea into Bengal is approximately as follows:—

		Tons.
Aden		180,000
Port Okha		5,000
Karachi—		
Grax Limited	10,000	
Laxmi Salt Works	7,000	
Star Salt Works	3,000	
		20,000
TOTAL		205,000

We have estimated that provided sufficient assistance is granted the output in India proper might be increased in the course of some years as follows:—

		Tons.
Okha		60,000
Karachi—		
Grax Limited	50,000	
Star Works	25,000	
Laxmi Salt Works	12,000	
		87,000
TOTAL		147,000

Following the usual methods of this Board the level of the protective duty is determined by the difference between the fair selling price and the import price. The former (*ex*-ship Calcutta) we

have found to be Rs. 66 and the latter at present Rs. 53 per 100 maunds. It would be necessary therefore to increase the present duty from Rs. 1-4 to Rs. 1-6 per maund. This increase in the duty would result in an additional burden of nearly Rs. 20 lakhs on the Bengal consumer. Admittedly Aden salt, which has for years held an established position on the Calcutta market, does not require protection. The proposal, therefore, amounts to this: the Bengal consumer is to be burdened with an annual payment of Rs. 20 lakhs in order to allow Port Okha and Karachi to place on the Calcutta market an output which to-day does not exceed 15,000 tons but may in the future amount to 147,000 tons. Taking the value of the salt according to present import prices at approximately Rs. 15 per ton *ex*-ship the annual additional payment by the Bengal consumer will far exceed the value of the Indian salt likely to be produced at Okha and Karachi for many years. Considering the limited extent to which the national interests would be served by the establishment of the salt industry at Okha or Karachi, it would be entirely unreasonable to expect the consumer in Bengal to shoulder a burden of this magnitude. A different conclusion might be reached if a reasonable prospect existed that stability of price would be secured and that over a long period the consumer would obtain his salt at a fair price but, in view of the price fluctuations and the speculation in the market, no stable price would thereby be secured under present conditions.

Bounty not justifiable.

70. Much the same objections apply to the proposal that the protective duty should be accompanied or replaced by a remission of a portion of the excise duty. This is in effect a proposal of a bounty. In view of the variations in price to which we have already referred, it is impossible to determine either the rate at which a bounty should be payable or the maximum amount to which it should be limited. Clearly Government cannot be expected to pledge itself to meet an unlimited charge and any proposal on these lines which is not accompanied by definite suggestions regarding both the rate and the total liability is unlikely to lead to any practical results Moreover as Aden is to be treated as part of British India for the purpose of this enquiry, it would be difficult to resist a claim by Indian manufacturers in Aden to share equally in any bounty sanctioned for the manufacture of fine white crushed salt in India. Although present prices are somewhat below economic levels, we have no reason to suppose that the larger manufacturers in Aden are likely to succumb to foreign competition and the payment to them of a bounty from Government funds could not be justified.

Maintenance of quality essential.

71. Another objection to a scheme of protection based on the levy of protective duties or the payment of a bounty arises in regard to the question of quality. This is specifically referred to in our terms of reference and we are required to consider whether steps should be taken to encourage the production of salt in India suitable for consumption in those markets which are at present largely supplied from abroad. It is clear therefore that

any scheme of assistance put forward by this Board should provide for the maintenance of a standard of quality at least equal to the present. In another respect also the enquiry on which we are at present engaged differs from most of our previous enquiries. Normally the industries which we investigate are infant industries the establishment of which is a slow process extending over a considerable period. Foreign competition therefore continues and this in itself ensures the maintenance of a certain standard of quality. In the Salt industry conditions are different. Already about three-quarters of India's requirements are supplied by the home production and the object of this enquiry is to ascertain whether India cannot be made completely self-supporting in respect of salt. The early and complete elimination of foreign salt is contemplated and thereby the inducement to the Indian manufacturer to maintain or improve his quality is removed. In the stress of competition between Indian manufacturers thereafter it is not improbable that the quality of salt may suffer. The cost of manufacturing salt is so small that there is little scope for lowering costs by increased efficiency and there is therefore a considerable temptation to the manufacturer to put on the market an inferior or adulterated salt at a cheaper price. That in such circumstances a real danger of deterioration exists is exemplified by the history of the match industry. In that industry foreign competition was practically eliminated by the introduction of a high revenue duty. Intense competition among Indian manufacturers followed: the quality of the matches produced undoubtedly suffered and it was not until the most efficient and powerful of the foreign manufacturing firms had established itself in the country behind the protective wall created by the revenue duty that the quality of Indian matches appreciably improved. Neither the imposition of a protective duty nor the grant of bounty affords any guarantee that quality will be maintained and we believe that we are precluded by our terms of reference from proposing a solution which ignores this aspect of the problem.

Other suggestions considered.

72. The Karachi manufacturers have proposed that minimum prices for different qualities of salt should be fixed at the average of the rates realised during the 24 months ending in August 1929, and that no importer should be permitted to sell at less than the fixed price. Indian manufacturers (excluding Aden manufacturers) weanwhile should be allowed to import and sell their salt at the best price available. The quality of a salt is at present determined by the country of origin but in some cases salt coming from the same place has different quality prices, as for example salt from Spain or Aden. But assuming that it is possible to fix in a satisfactory manner the price of each kind of salt imported at present, there yet remains the difficulty that if, as is not improbable, salt were imported from an entirely new source, there would be no standard by which its price could be determined. Further, any system of minimum prices could be easily evaded by means of secret commissions and rebates. It is said that any extensive adoption of methods of evasion would

reveal themselves in the price of salt and steps could be taken to defeat them. Salt, however, passes through so many hands and is distributed over such vast areas that it is by no means certain that evasions of the minimum price could be detected at least without such interference with dealers and opportunities of petty harassment as would constitute an intolerable burden to the trade Attempts to fix price limits arbitrarily have invariably failed and it is now generally recognized that prices cannot be controlled unless supplies also are controlled.

Complete control alone will secure stability of price.

73. We have considered whether the object of the Karachi manufacturers could not be attained by Government assuming control of the import of foreign salt. In this event Government would purchase foreign salt at the best price obtainable and would sell it at a price high enough to allow Indian salt to obtain its fair selling price. The import of Indian (including Aden) salt would remain uncontrolled. From the administrative point of view there is little to choose between such a scheme and complete Government control since storage, grading and delivery of salt must also be in the hands of Government if the scheme is to be workable. Certain advantages might be secured thereby for the Indian manufacturer. He would retain his own trade marks and goodwill, would reap the reward of improved processes and would be subject to the minimum of Government interference and control. It is open to considerable doubt whether the Okha or Karachi manufacturers would improve their position to any considerable extent under this scheme. Aden competition would still have to be faced and it would not be impossible to arrange fluctuations in the price of Aden salt to the detriment of the Indian manufacturer. Further, if it were sought eventually to meet the whole demand with Aden and Indian seaborne salt, this could not be effected save by fixing a level in excess of what we consider an economic price. For, as we have seen, only a portion of the possible output at Karachi, and on the figures supplied to us, none of the Okha output can be produced at this price. Thus a permanent burden would be placed on the consumer. On the other hand, if the demand is to be met partly from railborne sources and partly from seaborne sources, intense competition will arise between Government and private manufacturers, with the consequent risk of friction and political agitation. Finally, the proposal affords no guarantee that any standard of quality in Indian crushed salt will be maintained. For these reasons we consider that this method of assistance affords no solution of the problem before us.

It follows from the preceding discussion that any scheme of protection for the Indian Salt industry should fulfil two conditions: it should adequately protect the Indian industry in which term we include Aden manufacture and it should involve no great sacrifice on the part of the consumer. None of the recognized methods or suggested solutions satisfies these two conditions. It has also become apparent that the present organization of the salt

trade involves fluctuations in price detrimental both to the manufacturer and the consumer. We have found that over a long period the price at which the consumer may reasonably expect to obtain his salt is Rs. 66 per 100 maunds *ex*-ship and this is an economic price for Aden manufacturers and for Indian manufacturers at any rate in respect of a portion of the possible output. Our conclusion therefore is that it is not in the national interest to encourage the production of Indian seaborne salt unless it can be manufactured and transported to Calcutta at a cost not exceeding on an average Rs. 66 per 100 maunds and that the only method of encouragement which we can recommend is stabilization of prices over a long period. This can only be effected by some form of organized control.

II.—Railborne Salt.

74. It remains to consider the advantages which would accrue from the encouragement of the production of fine white crushed salt at Khewra and the Rajputana sources of supply. The advantages in regard to additional employment, wages and profits would be the same as in the case of seaborne salt. But the freight charges, which in the case of seaborne salt remain in the hands of non-Indian shipping companies, would in the case of railborne salt accrue to the railway companies, most of which belong to the Government. Any profit on railway freight therefore would in the main be of direct assistance to the country's finance; while the additional traffic would also benefit Indian steel, iron and wagon companies. It is difficult to form any estimate of the additional earnings of the railway companies on this account but that it would be considerable we have no doubt. Assuming that 100,000 tons of imported salt is replaced by crushed Khewra salt, on the rates suggested by the Deputy Chief Commercial Manager, Rates and Development, East Indian Railway, an additional net receipt of Rs. 10 lakhs will accrue to the North-Western Railway and the East Indian Railway after allowing for the loss in traffic on imported salt. This however is not all. With the increase in output at Khewra substantial savings will be effected in the cost of production. Assuming a reduction of two annas a maund in the cost of production at Khewra, on an output of 60 lakhs of maunds there would be an annual reduction of Rs. 7½ lakhs, the bulk of which would represent a saving to the consumer. Finally it would appear from the evidence given by the railway authorities that there should be no difficulty in supplying salt to Bengal from these sources even in war time.

Advantages of supply from railborne sources.

75. It appears to us therefore that a much stronger case has been made out from the national point of view for the encouragement of the production of fine white crushed salt at Khewra and the Rajputana sources of supply and that any measures taken by Government should be designed in the first instance to secure this result. It is however clear that the extent to which the national

Survey of railborne sources essential.

interests will be served by the encouragement of the supply of rail-borne salt will depend on the possibility of enlarging the present output of the Government sources of supply. For, if a comparatively small supply only can be ensured, not only will the additional money retained in the country in the form of wages or railway freights be small also, but no positive guarantee will be afforded against shortage or rise in price in time of war. In Chapter II we have estimated that a supply of some 150,000 tons may be available in the near future. To what extent this may be increased it is impossible to judge on the information available to us. It is not impossible that modern methods of manufacture combined with the proximity of coal and lower railway freights to Calcutta may enable salt to be produced economically on the East Coast. Further, the existing sources of supply have been organized by Government solely to meet the demand of existing markets and the possibility of supplying the Bengal market has never been taken into account. Our first recommendation therefore is that Government should undertake a thorough survey of the possible sources with a view to determining the extent to which the Bengal market may be supplied by rail with fine white crushed salt. Until this survey has been completed, an attempt to assess with any precision the extent of the economic advantages which would accrue from the substitution of Indian for foreign salt, would manifestly be premature. Our report however would be incomplete if we failed to indicate the measures which in our opinion would in any case be necessary if Indian railborne salt is to replace foreign salt in Bengal. For the purpose of this report, therefore, it must be assumed that salt manufacture in India is capable of such development that in course of time a considerable portion of the 500,000 tons of salt now imported into Calcutta by sea will be manufactured in India and supplied direct by rail to the consuming centres.

76. If the whole of the Bengal market were supplied with salt by rail from Upper India stability of prices would be ensured. For the sources of supply are in the hands of Government and it is the accepted policy of Government to sell at cost price and vary its price as seldom as possible. It must not however be supposed that this result even in the most favourable circumstances could be brought about within any measurable period. Indeed as regards Chittagong and the area in its immediate vicinity, it is probable that the supply of seaborne salt will always be cheaper. For many years therefore it is likely that the import of salt, whether Indian or foreign, by sea will continue. We have seen how violent are the fluctuations in the price of salt and amongst the factors responsible for such fluctuations is the manipulation of supplies by foreign manufacturers or importers. So long as frequent and extensive variations occur in the price of imported salt, it would be impossible to undertake the manufacture of white crushed salt at Khewra or the Rajputana works. The manufacturer would have no guarantee of the extent or permanency of his market since at any moment this is liable to be seriously affected

Control necessary to secure stability of price.

by a reduction in the price of foreign salt. Since his costs are dependent largely on output the Indian manufacturers' position would be hazardous in the extreme. At Khewra and Sambhar, where manufacture and sale are in the hands of Government, even greater difficulties would have to be faced. It would be contrary to Government's price policy to make good losses incurred in periods of low prices by additional profits when the price of imported salt is high. It follows therefore that until the price of imported salt is stabilized, it will be impossible to undertake the supply of Indian salt by rail to the Calcutta market. But before stability can be assured it is necessary to remove the causes of price variation. The chief of these is the manipulation of supplies by manufacturers and importers, unmethodical and haphazard shipments resulting from the regulation of supply being in the hands of numerous firms and direct and violent reductions intended to drive newcomers out of the market. It appears to us therefore that if stability of price is to be attained, there is no other alternative but to concentrate supply, import and sale in the hands of Government or of some authority appointed by Government. Thus in the case of railborne salt also we are forced to the same conclusion that if the manufacture of white crushed salt is to be encouraged in India the only ultimate solution is the introduction of some form of organized control.

CHAPTER VII.

Advantages of Control.

77. It has been found that it is essential to organise a system of control if the Indian industry is to be protected without inflicting a burden on the country incommensurate with the extent of the national interests to be served thereby. In arriving at this conclusion it has been assumed that the introduction of a system of control of the supply and sale of salt in the Bengal market will be sufficient to ensure a reasonable measure of stability in the price of this commodity. This assumption must now be examined. It may be objected that even if the import of salt by sea into Calcutta and Chittagong by private agency is prohibited and the purchase and sale of such salt remains entirely in the hands of Government, stability of price is not necessarily secured. For, as has been shown elsewhere in this report, there are many causes for variations in the price of imported salt which are outside the control of the importer. It might therefore appear that even under a system of control constant adjustments in price would be necessary. Since this objection if upheld would seriously affect the validity of our conclusions, it is necessary to consider the matter in some detail.

Will control necessarily secure stability of price?

78. Let it be assumed that the private import of salt by sea into Calcutta and Chittagong has been prohibited by law, and that Government holds a monopoly of purchase and sale of salt destined for the Bengal market. As regards railborne salt there is no difficulty; the cost of production and incidental charges are known: railway freights are under normal conditions subject to little variation. There is therefore no difficulty in securing stability of price for railborne salt. As regards seaborne salt from Aden and the Continent of India we have seen that the price at which the Bengal consumer may reasonably expect to obtain this salt over a long period is Rs. 66 *ex*-ship Calcutta. This price less brokerage at 10 annas per ton is the price which, consistently with the national interest, could be offered by Government to the Indian or Aden manufacturer. We consider that this figure represents a fair average price over a long period and makes allowance for freight variations. It is not therefore contemplated that it should be changed save in very exceptional circumstances or when by lapse of time conditions of manufacture have completely changed. The price for Indian seaborne salt can therefore, if our proposals are accepted, be regarded as stabilized. The present supply of railborne and seaborne salt from Indian sources is, as we have seen, insufficient to meet the full requirements of the Bengal market and it will be necessary for some time to continue to import foreign salt. It is here that the possibility of variation in price arises.

Uncertainty due to imports.

79. Government's object must be to sell as nearly as possible at the figure which we have taken as the fair selling price, *viz.*, Rs. 66* per 100 maunds *ex*-ship. The difference between this figure and the price which Government would pay to the Indian manufacturer, *viz.*, Rs. 63-11* representing the brokerage charges we have taken into account in fixing the fair selling price *ex*-ship Calcutta, should be sufficient to cover administration expenses. The only question therefore is whether in the initial stages of the scheme it is probable that Government will be able to obtain foreign second grade salt at or below Rs. 63-11 per 100 maunds. The present price of Red Sea salt is about Rs. 53 per 100 maunds *ex*-ship Calcutta. We have already referred to the overproduction of salt, particularly at works established along the Red Sea Coast. These depend almost entirely on the Indian demand; as the supply of Indian salt increases, the available market for foreign salt will be restricted. It is probable therefore that competition for so much of the market as remains will be intensified. The price of foreign solar salt is unlikely therefore to rise in the immediate future and Government should be able to purchase at a price considerably below Rs. 63-11. If then second grade salt is sold at a uniform rate of Rs. 66 *ex*-ship in the Calcutta market for some considerable period a profit should be secured on that portion of the total sales which is imported from abroad. This profit should be funded and the fund utilized to maintain the sale price of salt unchanged should the price at which Government can purchase foreign salt rise above Rs. 63-11.

Margin between purchasing and selling price.

80. It is however possible that for extraneous reasons which cannot be foreseen the price of imported salt may rise so high that it cannot be completely met by the utilisation of a stabilisation fund. In such circumstances a system of control will be of advantage in providing a check on the tendency of prices to rise to an unduly high level. When in regard to any commodity a country is not self-supporting but depends to a considerable extent on importation from abroad, the level of prices in the country is determined by the price at which the commodity can be imported. Thus if on account of the outbreak of war or any other reason the price of imported salt rose to a very high level, this price could not be controlled in any way by Government sales of Khewra or Rajputana salt at cost price if the market was regulated by competition only. The only effect of such sales would be to swell the profits of dealers, since under market conditions they would sell Government salt at approximately the same level as imported salt. On the other hand if Government held complete control of the import and sale of salt *ex*-gola Calcutta, it would be possible to average the price of imported and Indian salt, and thus afford appreciable relief to the consumer.

Steadying influence of control on prices.

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* *N.B.*—On account of freight differences these prices must be raised by about Rs. 3-8 per 100 maunds on salt *ex*-ship Chittagong.

81. Present circumstances as we have pointed out appear favourable for stabilizing the price of salt in the Calcutta market and once this end is attained the advantages associated with control in Northern India may be expected to result. Not only will a fair price be assured for Indian manufacturers but the consumer will also be protected against those rings and combines of manufacturers which have from time to time been successful in maintaining abnormally high prices for considerable periods. Further, with the price of salt fixed competition should ensure that wholesale dealers' and to some extent retailers' profits also will be kept at a moderate figure. It would no longer be possible for dealers to advance their prices as importers' prices rose and to maintain them when reductions in import prices occurred and it would not be unreasonable to suppose that if the initial price were stabilized for a period of years and full publicity given to it, both wholesale and retail prices would work to a figure which in time might almost have the sanction of custom.

Effect on retail prices.

82. Another cause of speculation which adversely affects the interests of the consumer arises in connection with the large number of different kinds of salt placed on the Calcutta market. At present salt is sold according to the country of origin and the price secured is not always in accordance with the comparative quality of the salt, judged even by the prevailing tests of colour, dryness and evenness of grain. Further within certain limits, the large number of kinds of salt on the market encourages speculation since supplies can be manipulated with greater ease than if the number of qualities were restricted. Under a system of Government control, we should propose that salt should be graded into two classes, first and second quality salt. The first would correspond to Liverpool or Hamburg quality and the second would comprise all kinds of solar salt. For second grade salt a standard price of about Rs. 66 *ex*-ship would be charged. Liverpool salt normally stands about Rs. 8 per 100 maunds higher than solar salt and for first grade salt the standard price would normally be about Rs. 74. There would be little difficulty in prescribing specifications for the two classes. Dryness is determined by the sodium chloride content. Again as will be seen from the results of analyses carried out at the Government Test House, Alipore (Tables No. 2 and 3), a salt with a high sodium chloride content is seldom a dirty salt and has therefore a low percentage of colour. The main test therefore would be the sodium chloride content. Such a test should present no practical difficulty and has, in fact, been adopted in Japan for the grading of salt. If necessary however colour tests could be prescribed in addition. Grain is mainly a question of milling and presents no great difficulty. Speaking generally, we consider that subject to further expert advice the first class of salt should contain on the basis of the method of calculation employed in the analyses given in paragraph 4 not less than 97 per cent. sodium chloride and the second class not less than 92 per cent. We attach great importance

Elimination of speculation by grading.

to this proposal. For it would be extremely difficult for Government to fix a separate price for each class of imported salt or indeed to regulate the supply to the market demand. Further, with a uniform quality of salt and sufficient publicity afforded to the price levels, it appears to us that competition among retailers is likely to be enhanced and the possibility of the exploitation of the consumer considerably diminished. An additional advantage to the consumer lies in the fact that the quality of the salt is guaranteed, so that in point of sodium chloride content he obtains fair value for his money. It may be objected that a scheme of this nature involves hardship to the consumer in that his selection is limited. We have found however that in the Districts generally speaking only two grades of salt are sold, *viz.*, Aden and Liverpool. Further we have satisfied ourselves from the evidence of dealers that salt of the required specification would be readily accepted and would in every way satisfy the present requirements of the market.

Untrustworthiness of existing data regarding wholesale and retail prices.

83. In our opinion therefore the establishment of a system of control in the Bengal market will not merely provide an effective method of assistance to the Indian Salt industry but also benefit the consumer of salt by reducing the opportunities for speculation among dealers. It is impossible however to state precisely to what extent the consumer will benefit from our proposal. The figures of wholesale and retail prices as published in official reports are entirely inadequate for our purpose. We have no means of judging the reliability of the sources from which those figures are obtained or of the methods by which they are collected. Frequently they represent simply arithmetical averages of prices in each district and do not take account of the quantities sold at different prices or of the cost of transport to different localities in the district. Obvious anomalies occur. We have found cases in which the retail price in a district is shown as below the wholesale rate: in other cases the wholesale rate in stations outside Calcutta is below the Calcutta price. Occasionally too it would appear that the wholesale rate quoted is the rate at which the dealer buys not the rate at which he sells. Retail rates are given in seers to the rupee. Since the ordinary monetary unit of purchase is an anna or fraction of an anna, it is clear that such quotations must be misleading and in our opinion they approximate much more closely to wholesale than to true retail rates. So far as we were able to ascertain the retail trade in salt resembles retail trade in other commodities in that where the monetary unit is low and the turnover is small profits are on a high scale to cover overhead charges. The scale of profit differs very much in different localities and the cause of variation and in particular the relation of wholesale to retail rates are matters which admit of no general explanation. Each locality presents a separate problem and any suggestions for the reduction of retailers' profits would require an intensive study of the prices and conditions of each local market.

84. We are satisfied, however, from a general review of the circumstances with regard to the supply and sale of salt in different parts of India that in those areas where some kind of control over prices now exists by reason of Government producing the salt or having the option of buying it, the position of the consumer is more satisfactory than in other parts where there is no control. In Northern India, under Government's cost price policy, stability of initial prices has been secured and this, combined with unrestricted issue under the indent system, has been sufficient in normal times when supplies are adequate to restrict the wholesale dealers' profits to a reasonable figure. Similarly in Madras, under the system of modified excise and the competitive conditions which prevail among the large number of small manufacturers, profits tend to be moderate. In Bombay, on the other hand, where production and sale is in the hands of excise licensees subject to no control by Government, the manufacturers' profits are higher, especially in the areas near Bombay where there is little risk of competition from salt manufactured elsewhere. In Bengal where the consumer depends for his salt on the uncontrolled operations of large importers the situation is practically the same or perhaps worse on account of the opportunities of speculation afforded by the frequent variations in import prices. In the case of a commodity like salt which is a necessary of life and in the price of which the duty forms so large an element, Government have a special responsibility for ensuring that prices are reduced to the lowest possible level. We have proposed a system of control primarily in the interests of Indian manufacturers of salt, but it is no small part of our case that the consumer will derive from it the advantages we have indicated.

Control will benefit consumer.

85. A further advantage of control is that the acquisition of another source of supply would be of considerable assistance in checking speculation in salt in Upper India, which is liable to occur whenever the output of the Sambhar works appears likely to fall below normal. A recent example of this occurred in 1928-29. It is unnecessary to examine the causes at any length. It is sufficient for our purpose to say that in 1927 owing to an unfortunate calculation on the part of Government of the reserves which it was necessary to maintain at Sambhar production in the following season was considerably restricted. Speculators were quick to take advantage of the position. As soon as the contraction of output became known, indents poured in and although indenting was stopped by order of Government at the end of November 1928 orders had by that time been accepted which it has been impossible to execute even up to the present time. The position was aggravated by the disastrous floods of 1929 which destroyed over ten lakhs of maunds. Throughout the whole of 1929 it was quite common for dealers to secure profits of Rs. 50 to Rs. 60

Control would also facilitate salt administration in Northern India.

on a wagon of 267½ maunds In December 1929 we are told the profit per wagon touched Rs. 80. In circumstances of this nature the control of an additional source of supply would have been invaluable to Government. There is evidence to suggest that there is a considerable market in the United Provinces and in Bihar which though normally consuming Sambhar salt is prepared to substitute foreign salt at a favourable price. At the time when this shortage of Sambhar salt occurred owing to the manipulations of the Salt Importers' Association the price of foreign salt was still high. We have it on the evidence of dealers at Sambhar that had Government been in a position to import foreign salt at a reasonable price the position of speculators in Sambhar salt would have been precarious. It is clear that with a premium of nearly 5 annas a maund on Sambhar salt the area in which seaborne salt could compete would have been enlarged very considerably and would have tended to equalise the demand for Sambhar salt with the supply, thus limiting the opportunities to speculators.

86. It will be observed that there is nothing in our proposals which is inconsistent with the present policy of Government. Indeed this development may be regarded as necessary to give full effect to the present methods of administration in Upper India. Government's salt policy aims at stabilizing the initial price at a level not in excess of the cost of production and at maintaining that price unchanged for lengthy periods. In order to prevent fluctuations in costs which might defeat this policy and also with a view to reduce costs to the lowest possible figure Government attempts to stabilize the demand for each source of supply. But so long as salt can be imported by sea into Bengal and sold with no Government control beyond what is necessary to protect Government's revenue interests the attempt to stabilize demand for each source of supply cannot be fully effective. Even at present the markets for Sambhar salt and foreign salt overlap and the demand for Rajputana salt is to some extent dependent on the price of foreign salt. We have been informed that in consequence of the recent reduction in price Aden kurkutch salt is being sold in competition with Sambhar salt as far afield as Agra. If the manufacture of fine white crushed salt is undertaken by Government without some control of imported salt stabilization of demand becomes impossible. Logically therefore the assumption of control by Government is merely an extension or development of the present price policy. Since the proposals are in general accord with Government's existing policy, administrative arrangements should present no great difficulty and it should be possible to introduce the scheme with little modification of existing arrangements for distribution. Subject to satisfactory price quotations, the existing import agencies might be utilized by Government for the purchase and delivery of foreign salt. The indent system already in force in Upper India would be followed in effecting initial sales.

Control consistent with present policy of Government.

87. It is perhaps necessary to explain here the working of this system. In Northern India the policy pursued by Government in respect of the sources under its control is as follows. The price of salt is calculated to cover the average cost of production of the different works considered together. The present prices charged are at Khewra 4 annas 6 pies, at Sambhar 5 annas and at Pachbadra 4 annas a maund. With a view to avoiding speculation these prices are changed as seldom as possible. Salt is sold to the public in wagon loads only, each wagon load containing 267½ maunds. The first step to be taken by a purchaser is to submit his application at an authorised treasury, sub-treasury or post office notified by the Commissioner, at the same time depositing the duty on and the price of the salt applied for together with all miscellaneous charges such as bagging, weighment, etc. An indent is then prepared and forwarded by the officer in charge of the Treasury to the Assistant Commissioner. This officer checks the indent and if it is found to be in order, an authority for the issue of salt is prepared and forwarded to the Superintendent in charge of the store. The salt is then loaded and despatched by rail direct to the consignee or his nominee, the railway receipt being sent by post freight to pay. All indents are registered and salt is despatched according to the priority of such indents. If a person desires to obtain salt under the credit system it is necessary for him to deposit with the Commissioner security for payment and to execute an agreement in the approved form. Payment of price and duty is then postponed for a period not exceeding 6 months from the period when it becomes due. A trader availing himself of the credit system is required to forward his indents direct to the Assistant Commissioner, who maintains a pass book for each credit, enters all issues therein and sees that the accounts are duly adjusted at the expiry of the six months' credit. This system could be readily adopted to the sale of salt in Calcutta.

Salt policy of Government in Northern India described.

88. It is obvious that in existing circumstances any attempt at direct control of retail sale by Government would be impossible. Even control of wholesale prices at district headquarters presents very grave difficulties. The necessity of maintaining adequate supplies at large centres implies the construction of extensive warehouses and the capital cost of these together with the cost of maintenance and staff and the additional expense involved in storing and issuing the salt, might not improbably result in an increase rather than a reduction of salt prices. A system of wholesale agents appointed by Government working on commission might be more satisfactory. The system was partially introduced in the post-war years, but was never given a fair trial. It is however difficult for Government to obtain the right class of agent or to exercise effective control over him, while suspicion of appointments being made for political reasons creates constant friction. We consider therefore that at any rate in the early stages if

Difficulties of controlling prices.

Government control is introduced, it should extend no further than to sale *ex*-ship or *ex*-golah in Calcutta or f.o.r. works in the case of the Northern India factories.

Advantages of control summarised.

89. We may now sum up the advantages which the control of imported salt may be expected to secure. For the Indian manufacturer a fair price will be ensured, sufficient to give a reasonable return on investment where manufacture is carried out on economic lines. This price would be no higher than that at which salt may be expected to be obtained over a series of years and would be considerably below that which the consumer has had to pay on an average during the past five years. No burden will thereby be thrown on the consumer: on the contrary he will be protected from exploitation by combines of foreign manufacturers. By stabilizing prices and standardizing quality, speculation will be minimised and prices further reduced. Finally, by acquiring an additional source of supply Government may be in a position to make good shortages in Upper India, which from time to time in the past have given rise to speculation and high prices in the markets normally served by the Rajputana works.

CHAPTER VIII.

Agency of Control.

90. In the preceding chapters we have assumed for convenience of discussion that control would be exercised by Government. But the question whether control should be in the hands of Government or of some other agency involves important issues which have a direct bearing on our proposals. It is necessary therefore to examine this question more closely. At the present time so far as sale and distribution form a part of Government's responsibility in connection with salt, the primary agency in this respect is the Central Board of Revenue. Without desiring in any way to minimise the important results which have been obtained by Government's action in the past, it is necessary to point out that Government is perhaps not the best agency for the sale of this important commodity. The Central Board of Revenue is primarily concerned with the control of revenue collection and the distribution of salt on commercial lines may not unreasonably be regarded as alien to its proper function. We may admit that under our proposals in so far as the sale of salt is a public monopoly, distribution on strictly commercial lines is impossible since a limit must be imposed on the profits. Even so, it does not appear impossible to devise some machinery which, while free to a large extent from the defects of Government control, is yet more responsive to modern commercial conditions.

Government agency unsuitable for distribution.

91. Much has been said regarding the defects of Government control of industries and these are so generally recognised that it is perhaps superfluous to deal with the subject at any length. Government is admittedly conservative and slow to move; its financial interests in the salt industry are mainly revenue interests and it is not directly concerned with questions affecting the interests of the consumer, save in so far as serious abuses may give rise to public discontent. Further all matters connected with the salt administration are the subject of continuous political discussion. Political considerations therefore cannot be entirely excluded and decisions which should be taken on purely commercial grounds run the risk of being postponed so that the political atmosphere may not be disturbed. Moreover the general state of Government finances cannot be without effect on the financial management of the Salt Department and in times of stringency suggestions may be made in audit or otherwise regarding the stocks of salt maintained, which may not always be easy to resist. Finally it appears to us that the complexity of modern large scale distribution is such that no Government Department could spare the time nor would it have the necessary experience to introduce modern methods of distribution.

Inherent defects of Government control.

92. Apart from the substantial reduction in price which as we have shewn in the previous chapter may be anticipated from the introduction of control in the Bengal market, involving stabilization of initial prices and such further reductions as may result from increased production with consequent economy in manufacture, it appears to us that under existing methods of control no considerable decrease in the price of salt can be looked for. If efforts are to be made to secure to the consumer a still lower level of prices, it will be necessary to explore the possibilities of reduction in two different directions. The first of these concerns the relation of wholesale to retail prices. But any system designed to secure a reasonable relation of wholesale to retail prices implies the control of wholesale prices at destination and an abandonment of the existing policy under which owing to competitive conditions price at any given locality is determined by initial price, freight and incidental expenses. The principle now in favour among Trusts and Combines which hold a monopoly or *quasi* monopoly of sale is to fix their price at a level which while consistent with their standard of profit ensures the maximum consumption and is not so high as to encourage competition from new sources of supply. Obviously this principle cannot be applied without change in the case of a commodity such as salt where the demand is relatively inelastic. But in so far as cost of production is not accepted as the basis of local prices, it appears that the methods of commercial distribution present certain advantages. In other words the problem of price level should be envisaged not as a local problem depending on the cost of production but as a general problem for the whole market supplied. The object to be aimed at should be to secure for the whole market the lowest average price consistent with the costs of management and local prices should be determined with this object in view.

Possible further reductions: I. Relation of wholesale to retail prices.

The advantages of replacing a system of wholesale prices determined by initial price, freight and incidental expenses by a system which subordinates local advantages to the good of the country as a whole become more readily apparent when we consider the relation between wholesale and retail rates. In our report on the match industry we drew attention to the effect of the monetary unit on retail prices. We are satisfied that the same effect is apparent in the retail price of salt where sale is by the whole seer or whole measure The position is however complicated by the fact that the lowest monetary unit employed is very small, in Madras 1 pie and in other parts of India 1½ pies. Further, the unit of weight is itself subject to division. At the same time where the lowest monetary unit is employed, it appears to us that any variation in the weight of salt supplied is so considerable that the position of the retailer of salt is not greatly different from the match dealer. In other words the retailer's profit is generally customary but may be largely increased or slightly diminished by the pitch of wholesale rates. It would follow therefore that an increase in the wholesale rate need not necessarily mean an increase of the retail rate.

On the other hand a small decrease of the wholesale rate may in certain localities result in a considerable reduction in retail prices. The question of the relation of wholesale to retail prices offers a fruitful field of investigation with the possibility of considerable advantage to the consumer.

93. It is possible that such a system may result in a general levelling up of wholesale rates in localities in proximity to the areas of supply, though retail rates may not necessarily be affected. It is sometimes urged that the consumer in the vicinity of salt works has a natural right to the advantages of his geographical position and that any attempt to increase the price charged in such an area would be manifestly unfair. On reflection however it will be seen that the local consumer has little claim to obtain his salt at a price much below that charged in more distant markets. For if a manufacturer supplied only the local market, his output would be curtailed to such an extent as to increase his costs very largely. As an illustration we may give the figures which have already been set out for the Khewra salt mine. We have found that if the output is increased so as to meet the demand of the Bengal market for crushed salt, the all round cost of production would fall to 2 annas 10 pies per maund. This would justify a reduction in the price of rock salt from the present figure of 4 annas 6 pies per maund to 2 annas 10 pies. This reduction would however have been brought about not by any increase in local demand but by the supply of crushed salt to Bengal. So far as the question of natural rights arises at all, the consumer in Bengal would appear to have a prior claim to all economies resulting from increased production. This is indeed recognized in most modern commercial systems of distribution where a higher price is charged in the home market than in more distant spheres of operation. In the same way there is no intrinsic reason why a consumer of crushed salt nearer the source of supply should obtain his salt cheaper than a consumer at a greater distance. For to some extent Government themselves are responsible for concentrating manufacture in particular areas and no natural right therefore arises in favour of consumers located nearer the centres of production. In our view the claims of individuals or classes of the community arising from their geographical position have no bearing on the subject. The question of price must be determined on modern commercial principles, modified so far as is necessary to meet the requirements of a situation where the commodity involved is a necessary of life and the system of sale a complete monopoly.

Consumer's claim to geographical advantages.

94. The second direction in which some possibility of reduction in price occurs is in connection with the sale of salt by the packet. We have already referred to the fact that the monetary unit employed in the retail price of salt is very small. We ourselves had no difficulty in purchasing one pie's worth of salt on several occasions in the Madras Presidency receiving in exchange paper packets of salt of various

II. Packeting salt.

sizes. Our investigations led us to the conclusion that in these small sales, the profits received were high, the pie rate being 80 per cent. or more in excess of the anna rate, while the latter is of course very considerably in excess of the rupee rate or the wholesale rate. With so large a margin of profit there seems a distinct commercial possibility of placing on the market packets of salt of a fixed weight and selling throughout the country at a uniform price, dealers being remunerated on a commission or discount basis.

95. We believe that there can be no reasonable doubt that if the question of the relation of wholesale to retail prices is to be fully explored and its possibilities realized and if the sale of salt by the packet at a uniform price is to be undertaken on a large scale, Government is not the best agency of distribution. For it is clear that as a preliminary to extending distribution in these directions Government's cost price policy would require reconsideration. For with a system of free at destination wholesale quotations there could be no guarantee that even the average price received was not in excess of cost including freight and incidental charges. There are obvious political advantages in the present cost price policy, both from the point of view of Government and of the Legislative Assembly and a change may be considered inherently undesirable. If then it is considered desirable to explore the possibilities of further price reduction the only alternative is to entrust the purchase of imported salt and the distribution of all salt in Upper India to a commercial undertaking organized on the lines of a public utility company. Government would then be in a position to retain its existing cost price policy by selling direct to such an undertaking at cost price. Apart however from the question of policy we believe that it would be quite impossible for Government to undertake the sale of salt on a system of free at destination prices not necessarily corresponding to cost of production *plus* cost of transport and incidental charges but determined mainly by the relation between wholesale and retail prices. One of the great advantages of the present system is that it secures mobility of supply. It is open to a trader to transport his salt from the works to that locality in which the most profitable sale can be secured. Local shortages are thus prevented and any tendency to excessive local prices checked. If destination is determined at the time of sale, this mobility to a large extent disappears. It is true that local shortages can be made good from neighbouring districts, but this results in double handling of the salt with a considerable consequential increase in cost. Obviously therefore Government must take measures to ensure that local shortages do not occur. The possibility of establishing Government warehouses at District Headquarters on an extensive scale may be ruled out. Not only would the capital cost be so high as to affect the price of salt materially, but the charges for the maintenance of the depôts and the double handling involved in storing and removing the salt would be high. The only alternative would

These reductions not possible under Government control.

be a system of wholesale agents appointed by Government and working on commission. As we have already stated such a system is not likely to be effective. Nor do we believe that such agents if appointed by Government would be of the stamp required to investigate complicated questions regarding the relation of wholesale and retail prices. Further if the sale of packeting salt is to be undertaken, unless heavy additional freight charges are to be incurred, the work of packeting will have to be undertaken at convenient centres and work of this nature would be better and more cheaply undertaken by a commercial concern. We are forced then to the conclusion that no further considerable reduction in price other than the reductions indicated in the Bengal market is possible under the present system of control and if the possibilities involved in the variation of wholesale price at different centres, the adjustment of wholesale to retail prices and the sale of packetted salt are to be explored some other agency than Government must be employed. It is of course impossible in this report to set forth in full the constitution and functions of such an agency or Board, since these will doubtless change in the light of experience gained. We propose, however, to indicate the general lines on which a marketing Board might be constituted.

96. Since the Board would work so far as possible on commercial lines, it is obviously desirable that it should be constituted as a limited liability Company, on the lines of public utility companies. The first essential is that some inducement should be offered to the Board to secure that retail prices are fixed at the lowest possible limit. As in public utility companies profits would be limited, but it might be possible to arrange that some additional share in profits should accrue when as the result of economies in distribution the wholesale weighted average price of salt (excluding freight and incidental charges) was below a certain figure.

Marketing Board : Constitution.

97. It is obvious that if such a Board were constituted it would be necessary to entrust it with the sale not only of white crushed salt but of all salt in Upper India. Any other arrangement would involve competition between the Board and Government with constantly shifting areas of supply. Owing to the different systems of manufacture and sale in Madras and Bombay and the fact that individual lessees have acquired certain rights and usages we would not extend the operations of the Board to these provinces.

Area of operation.

98. In purchasing its requirements preference will be given to Indian salt. Purchase from the Northern India sources of supply will be at cost price, since this is the accepted policy of Government. Aden, Karachi or Okha salt will be purchased at the fair selling price already proposed. Foreign salt will be purchased only to the extent to which the demand cannot be supplied from Indian sources at the prices which have been indicated. In all cases salt will only be purchased if it conforms to the prescribed specifications in regard to sodium chloride content, colour and grain.

Purchase.

99. As already indicated, sale would be conducted through local agents on a commission basis. It may be impossible to control retail sale directly, but wholesale prices would be fixed by the Board at which each local agent would sell. Such prices would not necessarily represent cost *plus* expenses of delivery but might be so arranged as to level to some extent inequalities in price resulting from the location of the different markets. Wholesale prices would however be adjusted as far as possible so as to ensure no more than reasonable profits on retail. Further, since the Board would hold a complete monopoly of supply, it would be possible in course of time to bring considerable pressure to bear on retail dealers whose prices were found to be excessive.

Wholesale distribution.

100. Clearly safeguards must be provided against profiteering, mismanagement and inefficiency which might result in the exploitation of the consumer or cause hardship by the insufficiency of supply. Further, in the case of a commodity such as salt which bears a heavy duty, Government cannot entirely divest itself of its responsibility. There must therefore be permanent Government representation on the Board of Directors, with a Government right of veto either general or under prescribed circumstances. As already stated, the Board should work on the lines of a public utility company the rate of profit being limited and related to the total consumption of salt in Upper India. Surplus profits should be funded and utilised for stabilizing or reducing the price of salt. It may also be necessary to prescribe the extent to which various interests may be represented in the management or control, or to restrict the amount of share capital which may be held by any individual or class. Further, machinery may be required for the settlement of disputes between the Board, Government or the manufacturer.

Control.

101. We do not suggest that such a Board can be constituted immediately or that if constituted its machinery can be organized save after a lapse of considerable time. Further, the full advantages of such control might not be realised for some years. We cannot overlook the fact that in the initial stages local shortages may occur and the interests of the consumer may be partly defeated by collusion between wholesale agents and retail traders. On the whole, however, we consider that with proper supervision and control a system of distribution of this nature, if it could be established, is the only means of reducing the price of salt generally throughout Northern India though, as we have seen, important advantages can be secured in the Bengal market by a system of Government control. In the meantime we are impressed by the fact that before such a Board can be constituted and while Government's survey of the possibilities of extending the sources of supply of railborne salt is in progress, a real danger exists that the salt works at Karachi, Okha and perhaps even the smaller works at Aden may be crushed out of existence by the pressure of foreign competition. We have

Government control as a provisional measure.

found that the retention of these sources is justifiable provided no heavy burden is thrown on the country since they afford some additional employment to Indian labour and serve to retain in the country some profit which would otherwise accrue to foreign manufacturers. Moreover, some portions of the Bengal market must, we consider, be always supplied more economically by sea than by railborne salt. It is therefore desirable to assist these undertakings if this can be effected at no great cost to the country. By introducing control into the Bengal market we believe that not only can an economic price be assured to Indian manufacturers but also the consumers' interests will be safeguarded, and prices averaged over a considerable period will decrease. We propose, therefore, as much in the interests of the consumer as of the Indian industry that Government should at once assume control of imported salt and should also standardise the qualities of common crushed and superfine salt. Foreign salt should be purchased at the lowest price obtainable to the extent to which the requirements of the market cannot be met from Indian sources. Indian seaborne salt should be purchased at the fair selling price which we have indicated, and efforts should be made to popularise the use of railborne salt from Khewra and Sambhar by the reduction of railway freights and possibly by the quotation of a lower rate for crushed than for uncrushed salt. A standard price for each of the two grades of salt imported by sea should be fixed, which should be in the neighbourhood of the economic price suggested by us, *viz.*, Rs. 66 per 100 maunds *ex*-ship Calcutta for second grade salt and between Rs. 7 and Rs. 8 more for salt of the first grade. After defraying the cost of administration any surplus profits should be funded for the purpose of stabilising the price of salt, which should not be changed save at lengthy intervals. The present system of supply on indent should remain unchanged and no attempt should be made, so long as control remains with Government, to interfere with the existing system of distribution through wholesale and retail traders. Government already has sufficient golas for the storage of salt and the proposals made are in general accordance with Government's salt administration in Northern India. It should be possible therefore to assume control with no undue delay. If these arrangements are introduced we are confident that though the maximum benefits which might accrue from a marketing Board constituted on commercial lines may not be secured, a considerable impetus will be given to the Indian salt industry and appreciable relief afforded to the consumer of salt in the Bengal market.

CHAPTER IX.

Miscellaneous.

Scope of control defined.

102. It is not part of our proposals that the control of the salt trade should operate to prevent the import of various brands of proprietary salts. These are imported in tins and packages and there should be no difficulty in arranging that salt in packages below a certain weight should continue to be imported and sold by private agency. This class of salt is generally of better quality and more expensive than the bulk of the salt in the Bengal market and the cost of packeting is considerable. It appears to us therefore that there is little danger of the objects of control being defeated by a provision of this nature. In ports other than Chittagong and Calcutta crushed salt is imported in very small quantities and there is no reason why control should be extended to such ports. The question of control in Rangoon will, as we have already stated, be considered separately. As regards salt other than fine white crushed salt at present imported into Calcutta, this falls into two classes, white kurkutch and brown Bombay kurkutch. For white kurkutch the arrangements we have proposed generally hold good. The difference in the fair selling price of kurkutch and crushed salt consist in the cost of crushing, which is estimated at Rs. 4 per 100 maunds. Deducting this the fair selling price becomes Rs. 62 per 100 maunds *ex* ship Calcutta and the price at which Government should be prepared to purchase Rs. 59-11 per 100 maunds. Subject to compliance with specifications as regards sodium chloride and colour, we propose that this price should be paid for Indian (including Aden) white kurkutch. Brown Bombay kurkutch which is the refuse of the salt made in the Bombay Presidency is used in parts of Bengal mainly for religious reasons. There are indications, as already stated in paragraph 1, that when the price of white kurkutch is fixed at a reasonable level the use of this inferior Bombay salt will gradually disappear. Meanwhile since the use of Bombay salt is confined to a limited area in Bengal there should be no difficulty, if control is established, in arranging to purchase it from Bombay at the best price available and distribute it to dealers in the localities concerned.

Position of Aden Salt Works.

103. Of the four salt factories in Aden, there are the property of Indians and the fourth is a private company of which Messrs. Burgeralla, an Italian firm, are the proprietors. Signor Burgeralla was the pioneer of salt manufacture at Aden and it is owing to his experience and enterprise that this industry has now established itself on a firm footing. The Aden Salt Works of which Messrs. Burgeralla are the proprietors were established in 1904, some seven or eight years before any of the other firms commenced operations. Under the terms of the agreement with Government, the Aden Salt Works are debarred from selling their salt locally and depend

entirely on the Indian market. In these circumstances any discrimination against this Company in favour of Indian Companies, such as has been suggested to us by some of the applicant companies, would manifestly be unfair. At the same time we feel that our recommendations must be in conformity with the general policy which governs the conditions under which public assistance is granted to industries. We have recommended that Government should purchase salt subject to its conforming to certain definite specifications from all Indian companies at a fixed price. We recommend that the same guarantee should extend to the Aden Salt Works provided that the Company is formed and registered under the Indian Companies Act, 1913, that it has a share capital the amount of which is registered in the Memorandum of Association in rupees and such proportion of the Directors as the Governor General in Council has by general or special order prescribed in this behalf consists of Indians.

Shipping facilities at Karachi.

104. There is one other matter to which reference must be made, *viz.*, the provision of shipping facilities for salt at Karachi. As we have seen the lighterage and other charges amount at Karachi to about Rs. 2 a ton against the figure for the Indo-Aden Works of 15 annas 6 pies. A hope has been expressed by manufacturers at Karachi that the provision of improved shipping facilities might, by expediting despatch, result in a considerable reduction in these charges resulting in an improvement in the general position of the salt trade. At present the Grax Company and the Star Company are served by a stonebunder adjoining the Grax Works. The channel from this is shallow and shipment can only take place at high tide. In country boats the total amount which can be shipped is about 100 tons a day, but with shallow draught barges about 250 tons a day can be shipped. It is clear that the activities of these two companies so far as export is concerned are much circumscribed since when tides are suitable, it may not always be possible to secure a steamer to Calcutta, while in any case the amount of any one consignment must be limited. The other point of shipment is the Government pier adjoining the Maurypur Works. This is some four miles distant from the Grax Works and rather further from the Star Works, but is suitable for all other works and for any future works which might be established on the undeveloped area to the west of Maurypur. The Grax Salt Company has put forward three schemes for the improvement of shipping facilities at the stonebunder—

(1) Dredging the channel so as to admit of loading at all tides.

(2) The construction of a ropeway across the harbour to the west wharf.

(3) The prolongation of the jetty into deep water.

As regards the first of these we understand that the danger of the channel rapidly silting up is considerable and that the main-

tenance charges would be very high. The Port Trust authorities are not in favour of the scheme and Messrs. Grax Limited have now withdrawn the proposal. As regards the proposed ropeway, the ground has not been inspected by engineers nor has any professional advice been taken or estimates framed. It is clear therefore that at this stage, the scheme cannot claim any consideration. As regards the third proposal, we have received from the Chief Engineer, Port Trust, an estimate amounting Rs. 2,46,800 and the service and maintenance charges are estimated at Rs. 25,792 per annum. At the present rate of wharfage, to cover the annual service and maintenance charges an annual export of 82,534 tons of salt from the Grax and Star Works would be required. A fourth scheme has been proposed, namely, to extend and improve the Government pier at Maurypur and to re-open and widen the channel, so as to provide for the handling of salt for export from all salt works at Karachi. This is the scheme favoured by the Port Trust. The initial cost is estimated at Rs. 1,72,200 and the service and maintenance charges at Rs. 18,512. At present wharfage rates, it would require the export of 59,238 tons of salt to cover these charges. From the financial point of view this scheme presents the greatest advantage. On the other hand, it must be remembered that the Grax and Star Works would be placed at a disadvantage as compared with other works in that the lead from their works is considerable; the construction of about four miles of tramway would be necessary and the upkeep of this and the rolling stock would involve additional expense. It has therefore been suggested that a possible solution might be found, if the Port Trust were prepared to construct and undertake the management of all the branch lines from the different works to the pier, charging each works a flat rate per ton of salt carried regardless of distance and also provide for the transport of the salt from pier to ship. We have not received any estimate of the haulage charges on such connecting lines, but on the basis of the figures supplied by the Port Trust, it appears probable that there would be some margin between the cost of transport from works to ship if undertaken by the Port Trust on the lines suggested and the cost at present incurred by the different companies, provided an export of at least 100,000 tons annually was secured.

It is clear that Port Trust authorities cannot be expected to provide shipping facilities if thereby they are involved in loss and it is essential therefore that the revenue derived from traffic should be sufficient to cover the annual service and other charges on any improvements effected. The financial success of any of the proposed schemes must depend on the amount of salt exported. In the past owing to fluctuations in the Calcutta market it has been impossible to foresee the extent of the export trade and it has been for this reason that the Port Trust authorities have insisted on a Government guarantee before any scheme of improvement was initiated. We do not wish to be misunderstood on this point. Government cannot guarantee the extent of the export of salt,

without in certain circumstances involving itself in financial liability. A guarantee of this nature therefore amounts to a conditional bounty to the Karachi salt manufacturers and is therefore open to the objections explained in Chapter VI. The location of the works with reference to shipping facilities is obviously a matter which should be carefully considered by manufacturers before works are established and as we have pointed out at Aden all the salt works have their own piers and tramway systems. But if our proposals are accepted, Government will guarantee to purchase the whole output of Karachi manufacturers at the price which we have indicated, provided quality conforms to the specifications which may be laid down. It will then be for the Karachi manufacturers to determine the extent of their production and with exact knowledge of the export it should not be difficult for the Port Trust authorities to determine and undertake whatever improvements appear to be required by the trade.

A. E. MATHIAS,
President.

J. MATTHAI,
Member.

R. L. WALKER,
Secretary.

7th June, 1930.

APPENDIX No. I.

Memorandum of conclusions.

1. The annual demand for salt in the areas normally served from Calcutta or Chittagong is approximately 500,000 tons.

2. In the Bengal market the primary considerations by which the quality of any particular class of salt is judged are whiteness, evenness of grain and absence of moisture.

3. On the basis of these tests imported salt falls into two broad classes:—

(*a*) Brine salt such as Liverpool and Hamburg salt,

(*b*) Solar salt such as Port Said, Aden and other Red Sea salts.

4. Apart from the qualities above mentioned, price is the determining factor in the demand for salt from any particular source of supply. The tendency in the last 40 years has been for the cheaper solar salts to replace brine salts. In this period the proportion of the market held by Liverpool salt has declined from 75 to 15 per cent.

5. The price of salt in the Calcutta market has fluctuated violently. Freight constitutes almost half of the total cost of salt and any considerable variation in freights must substantially affect salt prices, but the main cause of price fluctuations has been the operation of combines and dealers.

6. On at least three occasions a combine has been formed with the ostensible object of stabilising prices but in reality to retain the market against new importers. The latest of these combines was the Salt Importers' Association of Bengal formed in 1927. This Association artificially maintained salt prices at a high level during 1927 and 1928.

7. About 14 lakhs of tons of salt are produced annually in India.

8. Of this a very large proportion is dirty and unsuitable for crushing.

9. In Madras and Bombay manufacture is largely in the hands of private individuals operating on a comparatively small scale. In Upper India, the Rajputana sources of supply and the Punjab salt mines are worked by Government which thus holds a monopoly of supply and has the means of regulating wholesale prices.

10. Except in the salt mines of the Punjab and North-West Frontier Province, where rock salt is mined or quarried, the methods of manufacture are in essence the same throughout India, namely solar evaporation.

11. The successful manufacture of salt by solar evaporation depends largely on climatic conditions, such as high temperature, the absence of rain and the prevalence of strong winds throughout the year.

12. The whiteness of salt depends on its freedom from dirt. Dirt may be mixed with the salt from any of the following causes:—

(1) the character of the soil constituting the crystallizing pan bed,

(2) the absence of care in preparing the bed,

(3) careless scraping and collection,

(4) want of due precaution in storing, or

(5) the prevalence of dust storms.

13. Except the last these are all preventible causes and even the effects of dust storms can be mitigated by the erection of suitable sheds for storing and it therefore follows that white salt can be prepared at a cost in most parts of India where brine of sufficient density is obtainable.

14. The purity of salt depends largely on the care exercised in manufacture, in particular on the attention paid to the density of the brine at the time of crystallization and to the final washing of the salt. A non-porous bed for the crystallizing area is also essential, but this can be secured by the use of artificial beds such as cement or asphalt beds.

15. We find therefore that salt of a quality suitable for consumption in the Bengal market can be manufactured by solar evaporation in any part of India where a brine supply is available either from the sea or from subsoil sources, the cost of manufacture necessarily varying according to local conditions.

16. We find that Karachi and Okha enjoy certain natural advantages which *primâ facie* indicate them as more suitable centres for the manufacture of fine white salt by solar evaporation.

17. On a comparison of the results of the analysis and tests carried out at the Government Test House, Alipore, we find that Karachi and Okha salt is not inferior in sodium chloride content or colour to Aden salt and that rock salt from the Khewra mines when crushed compares favourably both in colour and sodium chloride content with Liverpool salt.

18. Though we are satisfied that salt of the required quality can be produced in India, the present production is small amounting to about 15,000 tons.

19. On a review of local conditions, we are satisfied that the output of the existing works at Okha and Karachi could be increased to approximately 150,000 tons annually.

20. We consider also that the output of railborne salt (*i.e.*, salt from Khewra, Sambhar and Pachbadra) could be increased by 150,000 tons and that this salt, if crushed, would be suitable for the Bengal market.

21. Assuming that Aden continues to import 180,000 tons, practically the whole demand of the Bengal market (500,000 tons) could be supplied by India and Aden.

22. We find that the fair selling price of Indian (including Aden) second quality seaborne crushed salt in bulk is about Rs. 8 per ton *ex*-works: this salt would correspond in quality to the salt referred to in (*b*) of paragraph 3.

23. We consider that the fair selling price for Khewra salt *ex*-works (excluding the cost of gunnies for packing) on a manufacture of 60 lakhs maunds will be:—

Uncrushed	As. 2-6 pies per maund.
Crushed	As. 3-2 pies per maund.

24. Whatever may be Government's interpretation of the treaties concerning the royalties payable to Indian States in connection with the manufacture of salt at Sambhar, we consider that from a commercial point of view a higher royalty than 8 annas a ton cannot be justified. We consider therefore that the fair selling price of Sambhar salt is about As. 2-8 pies per maund uncrushed or As. 3-5 pies per maund for white crushed salt.

25. We have taken the fair selling price of Indian seaborne salt in bulk as Rs. 8 per ton *ex*-works. To obtain the fair selling price f.o.r. Calcutta the following charges must be added:—

(*i*) cost of transport from works to ship,

(*ii*) sea freight,

(*iii*) landing charges from ship to golas,

(*iv*) handling from gola to waggon.

26. The cost of transporting salt from works to ship varies considerably in different places. At Aden this item amounts to 15 annas 6 pies, at Okha to Rs. 1-13-2 and at Karachi to Rs. 2. Since the price at which the consumer may be expected to obtain his salt over a series of years is governed mainly by the cost of Red Sea salt, we take Re. 1 as the cost of transport from works to ship.

27. Sea freights also show considerable variation. Freight from Okha is at present Rs. 7-8-0 per ton, from Aden Rs. 7-8-0 and from Karachi Rs. 6. We have been informed that these rates are low and over a period of years it appears to us safer to take a figure of Rs. 8. To this have to be added incidental expenses amounting to 6 annas and brokerage in Calcutta amounting to 10 annas.

28. The total cost of removing salt from the ship to the Sulkea golas amounts to Rs. 3-2-0 per ton.

29. The charges to be incurred in connection with the storage in golas, weighment, bagging and final removal for despatch by rail amount to Rs. 2-2-1 per ton.

30. The price at which the consumer may normally expect to obtain seaborne salt is therefore

	Rs.	A.	P.
Ex-works	8	0	0
F.O.B.	9	0	0
Ex-ship	18	0	0
Delivered in gola	21	2	0
F.O.R.	23	4	1

This corresponds to a price of As. 13-9 pies per maund or approximately Rs. 86 per 100 maunds f.o.r. Calcutta.

31. The question of reducing railway freights with a view to encouraging the import of crushed salt by rail into Calcutta has not as yet been considered seriously by the railway authorities.

32. We have examined representatives of the various railway administrations and it appears that with a view to enable railborne salt to compete with salt imported by sea the East Indian Railway in conjunction with the North-Western Railway is ready to quote a through rate of ·1 pie per maund mile from Khewra to Calcutta or 11 annas per maund. For intermediate stations west of Calcutta they would quote a station to station rate equivalent to the all—in cost of transporting seaborne salt from works to rail Calcutta (this has been taken at 8 annas per maund) *plus* the existing rail freight from Calcutta.

33. The Bombay, Baroda and Central India Railway is willing to quote in conjunction with the East Indian Railway a minimum rate of ·1 pie per maund mile from Sambhar, a rate equivalent to 8 annas a maund. No exact rates for intermediate traffic were quoted, but it was understood that these would be sufficiently low to attract this new traffic.

34. The existing rate from Naupada to Calcutta is five annas and the Bengal Nagpur Railway is prepared to quote the same rate from any other site on the East Coast nearer Calcutta at which a factory may be started.

35. At these rates Khewra salt could be landed f.o.r. Calcutta at 13 annas 10 pies per maund, and Sambhar salt at 11 annas 5 pies per maund.

36. Allowing for the fact that Khewra salt approximates in quality to Liverpool salt and that the latter fetches about Rs. 7-8-0 per 100 maunds more than solar salt, it appears that railborne salt can be landed in Calcutta at a price not more than that at which the consumer on an average may expect to obtain seaborne salt.

37. The question of the national interest may be considered from three points of view:—

(*a*) the possibility of affording increased employment to Indian labour,

(*b*) the possibility of retaining profits in the country and

(*c*) the possibility of insuring against a shortage of fine white salt in time of war.

38. Before considering these points the position of Aden in relation to India's salt supply must be considered. On the civil side Aden is subordinate to the Government of Bombay. Three of the four salt works are in Indian hands and the industry is liable to Indian taxation. Most of the superior labour employed at Aden is Indian. Both Karachi and Okha are equally liable with Aden to have their line of communication with Bengal interrupted in war time or to suffer from a shortage of shipping. From the national point of view therefore we find that there is no ground

to discriminate between Aden and Karachi or, in view of the declared policy of the Government of India, Okha.

39. As regards seaborne salt, *viz.*, salt from Aden, Karachi and Okha, if the whole Bengal market (500,000 tons) were supplied from these sources the total labour force required for this output would not amount to more than 4,000 and the additional employment afforded to Indian labour would not be large.

40. Taking profit at the rate of 10 per cent. per annum the additional profit retained in the country would not exceed Rs. 12 lakhs.

41. Since salt is normally transported by sea from Aden, Okha and Karachi, the existence of adequate supplies at these sources would not necessarily guarantee Bengal against a shortage of white salt in war time.

42. We conclude therefore that while the increased supply of seaborne salt from these sources is to some extent in the national interest, the advantage is not so great as to justify any drastic action.

43. The development of the supply of railborne salt to the Bengal market however offers the following advantages:—

(*a*) a guarantee against war time shortage,

(*b*) additional traffic for railways,

(*c*) a reduction in price of salt as the result of the increase in production, particularly at Khewra.

44. Our conclusion is that in the national interest the Bengal market should be supplied as far as possible by railborne salt, but that so far as this source of supply is insufficient, Indian seaborne salt should be encouraged provided that thereby no heavy burden is imposed on the country or the consumer.

45. We recommend that Government undertake a thorough survey of these sources of supply with a view to their development.

46. We also recommend that the question of railway rates should be fully investigated with a view to reducing the rates for salt to the lowest possible figure.

47. No development of Indian sources of supply of salt is possible until prices in the Calcutta market are stabilised.

48. As long as the import of salt remains in private hands, no stabilisation of prices is possible.

49. The first step therefore is for Government to introduce control of the import of salt into Bengal.

50. The effect of price variations due to causes outside the control of the importer might be neutralised by the formation out of profits of a fund to be devoted to the maintenance of a standard price level.

51. Such a step would be consistent with the general policy of Government Salt Administration in Upper India and is indeed necessary to give full effect to it.

52. Apart from the question of encouraging the manufacture of Indian salt, there are certain definite advantages in control.

53. By price stabilization the excessive profits of foreign manufacturers and middlemen would be eliminated.

54. With additional sources of supply at its disposal Government may be in a position to make good at any rate to some extent local shortages such as recently occurred at Sambhar.

55. It will be possible to standardise quality ensuring thereby better value to the consumer and removing one cause of speculation.

56. Instability of price renders a protective duty inadvisable.

57. A provision for off-setting duties would be necessary, but the variations in price are so frequent and so extensive that no system of off-setting duties would be effective.

58. The constant variations in duty would cause great market disturbance. Speculation would increase and the consumer would thereby be penalized heavily.

59. Salt is a subject of continual political discussion and any system of off-setting duties adversely affecting the interests of the consumer would be inexpedient.

60. The present production of fine white salt in India proper is inconsiderable. A protective duty of even four annas a maund would mean a burden on the consumer in the Bengal market of nearly Rs. 35 lakhs a year, which for many years to come would be out of all proportion to the advantages to be gained by the development of the industry.

61. In the present state of competition by private importers, it is probable that this burden would be permanent.

62. A system of bounties is impossible for much the same reasons.

63. With prices so unstable, it would be impossible to calculate either the rate or total amount of the bounty.

64. Further, if a bounty were sanctioned, it would be claimed by Aden also although the salt industry there is well established and has faced competition unaided for many years.

65. Under a system of bounties or with a protective duty, it would be difficult to ensure the maintenance of the present standard of quality, a matter which is specifically referred to in our terms of reference.

66. The Karachi manufacturers suggest that a minimum price should be fixed for each class of foreign salt at present imported, calculated at the average rates realised during the 24 months ending in August 1929 and that sale below these rates should be penalised.

67. This proposal is defective, since no standard exists by which a minimum price could be fixed for salt imported from an entirely new source.

68. Further, such a system would be easy to evade by means of secret commissions and rebates.

69. We have considered whether the object of the Karachi manufacturers could not be attained by Government assuming control of the import of foreign salt and selling it at a price high enough to allow Indian salt to obtain its fair selling price, Indian salt being imported and sold by the manufacturers free of control at the best price available. But if this control was temporary, on its removal Indian salt would still be unable to face the peculiar competitive conditions which exist in this market.

70. In any case the burden on the consumer would be out of all proportion to the national advantage gained by the encouragement of the Indian seaborne salt industry.

71. We consider therefore that none of the ordinary methods of protection is suitable in this case.

72. We consider that Government would not be the best agency for the sale and distribution of imported salt. It is concerned mainly with the collection of the salt revenue, is conservative and slow in action and is liable to be influenced by other than commercial considerations. Distribution is alien to its functions and such intricate operations as the adjustment of prices in different localities and the administration of an equalization fund to stabilise prices could not be safely entrusted to a Government department.

73. Were Government to assume control of distribution, it would be difficult to continue its present cost price policy, since to ensure stability of price it has been suggested that profits should be built up by the sale of salt in certain areas above cost price?

74. The maintenance by Government of a single price *ex*-works for all customers would also cause considerable alterations in existing market arrangements.

75. Increase in output at Khewra will reduce the all round cost of salt. If the control were in the hands of an agency other than Government this

reduction in price which in equity should accrue to the Bengal consumer would not necessarily be shared by the Punjab consumer of rock salt.

76. Government may however retain its present policy by selling its output at cost price to a Marketing Board which would be free to adjust its prices so as to secure a more equitable distribution of price.

77. The Board would be constituted as a public utility company, the rate of profit being limited.

78. There would be permanent Government representation on the Board of Directors with a Government right of veto either general or under prescribed circumstances.

79. The Board would be in charge of the import and sale of salt in the Calcutta market and of the sale of salt in Northern India.

80. The Board would replace the present system of cost price *ex*-works by a system of quotations for sale at destination, the method adopted in all modern systems of distribution.

81. It would follow that the Board would appoint its own agents in the main distributing centres.

82. Although no attempt would be made to control retail sale, in course of time it should be possible to stabilise prices at the principal distributing centres throughout the country.

83. This in itself should have a considerable effect in reducing retail prices.

84. In purchasing its requirements preference would be given by the Board to Indian salt of the required quality. Aden, Karachi and Okha salt would be purchased at the fair selling price fixed by this Board (the Tariff Board) either c.i.f. (subject to alteration in freight) or f.o.b. as the Marketing Board may decide. Salt from the Northern India sources would be purchased at Government's cost price.

85. Foreign salt would be purchased only to the extent to which the demand cannot be supplied at the prices already indicated from Indian sources.

86. In all cases salt would only be purchased if it conforms to the prescribed specification as regards sodium chloride content, colour and grain.

87. Surplus profits should be funded and utilised either for stabilising or reducing the price of salt.

88. Safeguards would have to be provided against profiteering or inefficiency on the part of the Marketing Board.

89. We do not suggest that such a Board can be constituted immediately or that, if constituted, its machinery could be organised save after a lapse of considerable time. Further, the full advantage of such control might not be realised for some years.

90. Meanwhile we are impressed by the fact that before such a Board can be constituted the salt works at Karachi, Okha and perhaps even the smaller works at Aden may be crushed out of existence by the pressure of foreign competition.

91. Although no heavy burden on the consumer is justified in the interest of the manufacturers of seaborne salt the national interests are served to some extent by its encouragement. Further, some portions of the Bengal market will always be supplied more economically by sea than by rail.

92. We propose therefore as an interim measure as much in the interests of the consumer as of the Indian industry that Government should assume control immediately of the import of salt into Bengal.

93. Indian seaborne salt should be purchased at a fair selling price and efforts should be made to popularize the use of railborne salt (crushed) from Khewra and Sambhar by the reduction of railway freights and if possible by the quotation of a lower rate for crushed than for uncrushed salt.

94. The balance of the requirements of the market should be purchased by Government from foreign manufacturers.

95. Salt should be graded into two grades.

96. A standard price for each of these two grades should be fixed, which in the first instance might be the average price of the last five years.

97. After defraying the cost of administration any surplus profits should be funded for the purpose of stabilising the price of salt. This price should not be changed save at lengthy intervals.

98. The present system of supply on indent should remain unchanged and no attempt should be made, so long as control remains with Government, to interfere with the existing system of distribution through wholesale and retail traders.

P. P. GINWALA,
President.

A. E. MATHIAS,

J. MATTHAI,
Members.

R. L. WALKER,
Secretary.

26th March 1930.

APPENDIX No. II.

Statement showing the imports of salt by Sea into Calcutta from 1903-04 to 1927-28.

— —	1903-04	1904-05.	1905-06.	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.	1911-12.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
United Kingdom .	55,21,794	56,59,739	44,75,849	54,64,684	44,33,476	46,37,468	37,35,556	42,39,257	47,72,797
Hamburg . .	13,29,158	12,58,183	6,13,859	10,12,129	13,78,521	7,61,036	7,83,302	6,43,137	9,16,685
Port Said . .	..	..	3,67,695	5,31,724	8,49,418	4,87,836	8,21,553	11,51,661	12,05,726
Salif . . .	12,50,270	15,46,995	20,85,844	9,80,212	21,77,532	24,88,270	11,47,211	14,46,802	16,34,379
Ras Rawaya . .	8,21,246	7,84,467	..	..	..	..	..	..	..
Aden . . .	13,57,021	14,58,788	16,85,140	12,62,458	15,97,109	16,23,361	11,49,659	12,72,816	14,84,511
Persian Gulf . .	1,09,162	82,588	64,528	57,768	..	..	..	..	..
Spain . . .	..	30,800	7,67,032	15,56,235	17,31,027	30,27,819	28,50,979	15,81,459	17,09,237
Massawah . .	..	..	..	..	..	..	2,99,845	6,64,685	6,64,013
Tunis . . .	..	..	..	..	..	..	..	..	1,72,576
D'jibouti . . .	..	..	..	..	..	..	..	..	..
Bombay . . .	2,55,880	5,70,830	7,28,988	6,33,939	9,58,461	8,84,967	8,86,214	8,79,753	8,31,784
Karachi . . .	..	..	..	..	..	..	..	..	..
Madras . . .	1,46,624	72,704	29,999	2,563	7,764	..	4,000	..	..
Total .	1,07,91,155	1,14,65,094	1,08,18,934	1,16,56,142	1,33,02,508	1,39,10,757	1,16,78,319	1,18,79,570	1,33,91,708

N.B.—The above table has been compiled from figures given in the annual reports on the administration of the Salt Department in Bengal.

Statement showing the imports of salt by Sea into Calcutta from 1903-04 to 1927-28—contd.

——	1912-13	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.	1919-20.	1920-21.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
United Kingdom .	38,85,514	32,51,339	21,48,495	32,61,220	24,32,049	3,16,475	9,00,493	19,34,033	23,43,154
Hamburg . .	8,43,483	7,66,016	4,66,347	8,060	..	..	..	..	20,52,747
Port Said . .	14,91,837	17,00,801	13,75,785	30,15,718	23,23,637	29,25,216	41,00,335	27,67,688	25,13,987
Salif . . .	8,97,582	19,12,025	5,33,986	..	..	..	..	..	..
Ras Rawaya . .	..	..	..	..	..	..	..	..	..
Aden . . .	26,60,079	23,47,404	32,14,010	19,73,402	19,00,881	25,50,598	23,45,478	30,49,969	35,83,035
Persian Gulf . .	..	..	..	..	..	..	..	..	..
Spain . . .	15,90,505	19,62,642	8,82,413	18,10,091	12,55,904	6,65,851	4,19,291	10,36,815	17,90,510
Massawah . .	7,42,548	13,13,424	11,26,695	16,54,875	10,35,814	12,02,075	11,47,005	14,52,744	14,62,875
Tunis . . .	..	..	..	..	..	..	..	..	1,18,750
D'jibouti . . .	..	..	..	..	..	..	..	..	..
Bombay . . .	9,34,430	9,38,017	8,75,790	4,25,319	3,60,797	28,961	44,523	4,23,488	4,49,974
Karachi . . .	..	..	..	..	..	..	..	..	..
Madras . . .	26,611	..	2,61,042	3,17,103	3,79,910	1,35,196	10,000	..	14,978
Total .	1,30,78,589	1,41,91,668	1,08,84,563	1,24,65,788	96,90,013	78,24,372	89,67,125	1,06,64,717	1,43,30,010

N.B.—The above table has been compiled from figures given in the annual reports on the administration of the Salt Department in Bengal.

Statement showing the imports of salt by Sea into Calcutta from 1903-04 to 1927-28.—concld.

——	1921-22.	1922-23.	1923-24.	1924-25.	1925-26.	1926-27.	1927-28.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
United Kingdom .	15,60,883	20,73,521	23,23,711		27,20,323	12,73,533	20,35,348
Hamburg . .	10,89,341	11,75,205	4,00,523		6,28,046	12,02,840	7,14,004
Port Said . .	17,91,401	18,49,142	12,26,370		17,63,094	26,26,657	22,95,794
Salif . . .	..	..	..		..	..	..
Ras Rawaya . .	..	..	..		..	..	..
Aden . . .	34,73,745	34,09,961	34,13,561	Figures not available.	43,15,459	35,65,499	37,11,452
Persian Gulf . .	..	..	..		..	..	..
Spain . . .	11,29,950	15,38,902	3,70,955		8,36,223	9,88,424	18,11,625
Massawah . .	11,93,628	10,92,323	12,86,630		11,80,351	14,77,453	12,97,412
Tunis . . .	..	..	..		..	..	..
D'jibouti . . .	..	..	..		3,71,459	1,83,710	1,96,340
Bombay . . .	4,90,187	7,63,737	2,53,931		3,36,366	6,02,018	8,78,786
Karachi . . .	..	..	1,189		..	..	..
Madras . . .	4,80,986	4,60,928	6,853		..	..	..
Total .	1,12,10,121	1,23,63,719	92,83,726	..	1,21,51,321	1,19,20,134	1,28,79,851

N. B.—The above table has been compiled from figures given in the annual reports on the administration of the salt Department in Bengal.

APPENDIX No. III.

Statement showing price of salt per 100 maunds ex *ship Calcutta from the years 1925 to 1929.*

Source.	1st Week January.	1st Week April.	1st Week July.	1st Week October.
1925.				
Liverpool	60/62	72	70	58
Hamburg	...	...	66	55
Spain	59	66	...	...
Mussawah	...	...	...	53
Port Said	...	66	...	53
Aden	...	66	...	52
Indo-Aden	55	65	59	...
D'Jibouti	...	...	...	..
Tunis	...	...	...	..
Bombay	...	...	...	..
Okha	...	...	...	...
Karachi	...	...	...	.
Romania	...	...	...	.
1926.				
Liverpool	62/65	...	113	122
Hamburg	...	...	...	118
Spain	...	...	...	...
Mussawah	...	...	75	...
Port Said	53	56	80	...
Aden	...	56	...	116
Indo-Aden	...	...	74	115
D'Jibouti	55	...	...	...
Tunis	...	...	...	...
Bombay	...	...	...	...
Okha	...	...	...	...
Karachi	...	...	...	...
Romania	...	...	...	...
1927.				
Liverpool	...	118	122	122
Hamburg, Vacca	110	112/114	102/121	118/120
Spain	...	103	118	118
Mussawah	100	101	116	116
Port Said	100	101	116	116
Aden	100	101	116	116
Indo-Aden	99	100	115	115
D'Jibouti	96/98	...	...	...
Tunis	...	...	...	...
Bombay	...	...	...	...
Okha	...	...	...	...
Karachi	...	...	...	..
Romania	...	...	...	.

Source.	1st Week January.	1st Week April.	1st Week July.	1st Week October.
1928.				
Liverpool	107	107	108	80
Hamburg, Vacca	104/106	104/106	105/107	77/79
Spain	103	103	104	76
Mussawah	101	101	102	74
Port Said	101	101	102	74
Aden	101	101	101	73
Indo-Aden	100	100	100	72
D'Jibouti	...	...	...	65
Tunis	...	...	...	...
Bombay	...	...	...	...
Okha	...	...	...	...
Karachi	...	...	...	...
Romania	...	...	...	...
1929.				
Liverpool	80	80	80	80
Hamburg, Vacca	77/79	73/79	73/79	73/79
Spain	76	72	72	72
Mussawah	74	67	67	67
Port Said	74	69	69	69
Aden	73	66	66	66
Indo-Aden	72	55	66	66
D'Jibouti	...	65	...	...
Tunis	...	...	...	...
Bombay	...	...	...	...
Okha	...	...	...	...
Karachi	...	...	...	...
Romania	...	...	...	...

APPENDIX No. IV.

Table showing imports of salt in maunds (nearest thousand) into Calcutta and average price per 100 maunds ex gola.

Source.	1923-24.		1924-25.		1925-26.		1926-27.		1927-28.		1928-29.	
	Quantity.	Average price for 100 mds.	Quantity.	Average price for 100 mds.	Quantity.	Average price for 100 mds.	Quantity.	Average price for 100 mds.	Quantity	Average price for 100 mds.	Quantity.	Average price for 100 mds.
	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.
United Kingdom . .	2,324,000	89	The annual report contained no figures for this year.		2,720,000	69	1,274,000	125	2,035,000	119	1,779,000	97
Hamburg . . .	400,000	83			628,000	62	1,203,000	80	714,000	115	608,000	97
Spain	371,000	84			836,000	63	988,000	82	1,812,000	105	1,325,000	92
Port Said . . .	1,226,000	79			1,763,000	60	2,627,000	75	2,226,000	112	1,901,000	91
Aden	3,414,000	79			4,315,000	58	3,565,000	78	3,711,000	99	4,378,000	87
Massawah . . .	1,287,000	79			1,180,000	61	1,477,000	80	1,297,000	112	1,305,000	90
D'Jibouti . . .	...	...			371,000	62	184,000	82	196,000	100	292,000	70
Bombay . . .	254,000	...	...	..	336,000	...	602,000	...	879,000	...	493,000	...
Weighted average price of imported salts other than Liverpool, Hamburg and Bombay.		Rs. A. P.				Rs. A. P.		Rs. A. P.		Rs. A. P.		Rs. A. P.
	...	79 4 0	...	...	...	59 8 0	...	78 0 0	...	105 0 0	...	88 8 0
The average wholesale price at which salt, other than Liverpool, Hamburg and Bombay salt has been sold in Calcutta during the five years 1923-24 and 1925-26—1928-29 is therefore									...	82 0 0	...	...

N.B.—The figures in the above table have been taken from the appendices of the annual reports on the administration of the Salt Department in Bengal.

APPENDIX No. V.

A.—*Comparison of the wholesale price of* **Liverpool salt** *f.o.r. Calcutta with the retail price in selected centres designed to afford an estimate of the margin between the wholesale and retail price of salt in the Bengal market.*

Year.	Price per 100 maunds ex-ship.	Price per 100 maunds f.o.r. Calcutta duty paid.	Price per maund f.o.r. Calcutta duty paid.	*Retail price in selected markets.					
				Arrah.	Purnea.	Daltonganj.	Dhanbad.	Giridih.	Madhupur.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1927.									
January	...	...	...	3 5 0					
February	...	...	...	...					
March	118	269	2 11 0	...					
April	118	269	2 11 0				2 12 7		
May	118	269	2 11 0						
June	122	273	2 11 8		3 4 8	2 9 0			
July	122	273	...				3 11 7		
August	122	...	...				4 5 7		
								2 11 11	2 3 0
September	...	...	...				...		
October	122	...	...	3 0 0			3 1 7		
November	107	258	2 9 3				3 11 7		
December	107	258	...				3 6 7		
1928.									
January	107	...	...						
February	107	...	...		2 10 8	2 9 0	3 11 7		
March	...	...	...						
April	...	...	...						

May	...	...	...	2	11	0											
June	..	..	..	3	0	0											
July	108	259	2 9 5	2	11	0											
August	80	231	2 5 0	3	0	0											
							2	10	8	2	9	0	3	11	7		
September	...	...	...	...													
October	...	...	...	...													
November	...	...	...	...													
December	..	..	...	..													
1929.																	
January	...	...	...	...												2	11 11
February	...	...	...	2	11	0										2	3 0
March	...	...	...	...													
April	...	..	...	...													
										2	4	0					
May	...	.	...	...									3	11	7		
June	...	...	...	2	11	0							...				
July	...	..	...	...									3	6	7		
August	...	...	...	...			3	4	8								
September	...	...	...	2	11	0							3	11	7		
October	...	..	...	...													
November	...	...	...	.													
December	...	..	...	...						2	2	4					

* The retail price given above is the price per maund equivalent to the price at which according to the reports of the district officers salt is sold by the seer in these markets after deducting the rail freight from Calcutta to destination and cartage at one anna a maund.

B.—*Comparison of the wholesale price of* **Aden salt** *f.o.r. Calcutta with the retail price in selected centres designed to afford an estimate of the margin between the wholesale and retail price of salt in the Bengal market.*

Year.	Price ex-ship per 100 mds.	F.o.r. Calcutta per 100 maunds duty paid.	F.o.r. Calcutta per maund duty paid.	* Retail price in selected markets.				
				Darjeeling.	Midnapur.	Jalpaiguri.	Gaya.	Daltonganj.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1927.								
January	..	..	..	..	..	..		
February	..	..	..	..	..	..		
March	100 8 0	251 8 0	2 8 3					
April	107 8 0	258 8 0	2 9 4					
May	107 8 0	258 8 0	2 9 4					
June	115 8 0	266 8 0	2 10 8					
July	115 8 0	266 8 0	2 10 8	2 12 0	3 2 8 to 3 7 8	3 13 9	2 11 6	2 9 0
August	115 8 0	..	2 10 8					
September	115 8 0	..	2 10 8					
October	105 8 0	256 8 0	2 9 0					
November	100 8 0	251 8 0	2 8 3					
December	100 8 0	...	2 8 3					

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